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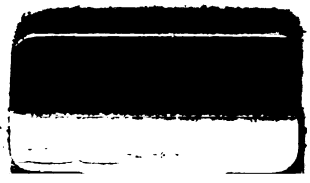

SB
21
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Sincerely Yours
Charles McLaughry

Trees, Fruits and Flowers

—OF—

MINNESOTA.

1902.

EMBRACING THE TRANSACTIONS OF THE

MINNESOTA STATE HORTICULTURAL SOCIETY

FROM DECEMBER 1, 1901, TO DECEMBER 1, 1902,
INCLUDING THE
TWELVE NUMBERS OF "THE MINNESOTA HORTICULTURIST"
FOR 1902.

EDITED BY THE SECRETARY,
A. W. LATHAM,
OFFICE AND LIBRARY, 207 KASOTA BLOCK,
MINNEAPOLIS, MINN.
Official Stenographer, A. G. Long, Excelsior, Minn.

VOL. XXX.

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1902.

THE MINNESOTA
HORTICULTURIST.

VOL. 30. JANUARY 1902. No. 1.

Biography.

CHAS. M. LORING,

MINNEAPOLIS, MINN.

The early years of the subject of this sketch were spent in Portland, Maine, where he was born of good New England stock. Locating at Chicago in 1856, he became a partner of B. P. Hutchinson in wholesale business until failing health influenced him to seek another climate, when he secured a situation with D. Morrison in Minneapolis during the year of 1860; soon after, however, joining Loren Fletcher in the general merchandise trade.

From 1868 to 1894 he was engaged in the milling business; and, since then, has been president of the Morgan Machine Co., of Rochester, New York.

Mr. Loring's energy, business qualifications, public spirit and affability led to his being chosen for many posts closely connected with the general well-being of the community in which he lives. We note his name among the city council from 1870 to 1873; as organizer of the North American Telegraph Co., serving as its president from 1885 until his resignation in 1897; first president of an improvement association existing here in early times; member of the Court-House Commission; president of the Board of Trade in 1875; president of Chamber of Commerce from 1886 to 1890; president State Board of Commissioners for securing Minnehaha Park; president of Board of Park Commissioners from 1883 until his resignation in 1893; for several years a vice-president of National Board of Trade; recently, president of the American Park and Outdoor Art Association, and now president of the Minnesota State Forestry Association. He has always been treasurer of Lakewood Cemetery Association, and is one of the trustees of Washburn Memorial Orphan Asylum.

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Mr. Loring's activity and unselfish efforts in movements pertaining to civic welfare and embellishment in the city of his adoption are recognized and appreciated by all who sympathize with such labors and estimate the results at their true significance, both in the present and future. His earliest effort in securing park property is not generally remembered. It related to the triangle now occupied by the old City Hall, which through his persuasion was deeded to the city by the different owners; and the council was also persuaded to vote funds for a suitable fence. From that date, 1864, he has been indefatigable in striving to secure land and perfect a park system, which is already counted as one of the main attractions of Minneapolis. A natural taste in this direction has happily been fostered and cultivated by extensive travels, both in this country and foreign lands, when keen observation, love of nature and intercourse with those of kindred minds have all contributed to render this pursuit a veritable passion.

Mr. Loring was one of the early members of the Minnesota State Horticultural Society, and one of the committee which revised its earlier constitution, and enjoys contrasting those former days with the present importance and success attending this organization—a success which appeals to him in every way: as a citizen of Minnesota, a lover of the country, a believer in farming pursuits, an admirer of fruit and flower culture and an ardent advocate of enlightened forestry. Mr. and Mrs. Loring are both life members of this society.

OFFICERS, 1902, MINNESOTA STATE HORTICULTURAL SOCIETY.

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First Congressional District.....Jonathan Freeman, Austin
Second Congressional District.....C. E. Older, Luverne
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EXECUTIVE BOARD.

(The president and secretary are members ex-officio.)
Wyman Elliot, (Chairman), 2 years.....Minneapolis
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J. P. Andrews, 3 years.....Faribault
L. R. Moyer, 3 years.....Montevideo
Prof. S. B. Green, 1 year.....St. Anthony Park
Clarence Wedge, 1 year.....Albert Lea

ASSISTANT LIBRARIAN.

E. A. Cuzner, Essex and 27th Ave. S. E.....Minneapolis

(The assistant librarian has charge of the surplus reports of the society, which are stored at Pillsbury Hall, State University. A part of the reports are stored in Horticultural Hall, at the State Experiment Station, in charge of Prof. S. B. Green.)

SUPERINTENDENTS OF TRIAL STATIONS.

Prof. S. B. Green (State Experiment Station)....St. Anthony Park
E. H. S. Dartt.....Owatonna
Dewain Cook.....Windom
O. M. Lord, (plums and small fruits).....Minnesota City
H. M. Lyman, (apples).....Excelsior
F. I. Harris.....La Crescent
L. R. Moyer ..... Montevideo
Mrs. Jennie Stager ..... Sauk Rapids
William Somerville ..... Viola
J. S. Parks ..... Pleasant Mounds
F. J. Cowles ..... West Concord

STANDING COMMITTEES FOR 1902.

FRUIT LIST.

Clarence Wedge ..... Albert Lea
J. P. Andrews ..... Faribault
Prof. S. B. Green .....St. Anthony Park

SEEDLING FRUITS.

O. M. Lord .....Minnesota City
F. W. Kimball .....Austin
Prof. S. B. Green.....St. Anthony Park

ORNAMENTAL LIST.

Fred Nussbaumer ..... St. Paul
F. H. Nutter .....Sykes Block, Minneapolis
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NOMENCLATURE AND CATALOGUE.

Clarence Wedge .....Albert Lea
Prof. S. B. Green .....St. Anthony Park
Prof. N. E. Hansen .....Brookings, S. D.

LEGISLATURE.

Wyman Elliot.....Minneapolis
J. M. Underwood ..... Lake City
A. K. Bush ..... Dover
W. W. Pendergast ..... Hutchinson
Prof. W. M. Hays ..... St. Anthony Park
A. W. Latham ..... Minneapolis

PUBLICATION.

Prof. S. B. Green .....St. Anthony Park
Wyman Elliot ..... Minneapolis
A. W. Latham ..... Minneapolis

GIDEON MEMORIAL FUND.

Wyman Elliot ..... Minneapolis
Prof. S. B. Green ..... St. Anthony Park
A. W. Latham ..... Minneapolis

PACKAGES AND MARKETING.

R. A. Wright ..... Eureka
Levi Longfellow ..... Minneapolis
W. S. Widmoyer ....Dresbach

ANNUAL MEETING, 1901, MINNESOTA STATE HORTICULTURAL SOCIETY.

The thirty-fifth annual session of our society was held in the lecture rooms of Plymouth Congregational Church, Minneapolis, the same place where the association met the year before.

In its general features the gathering corresponded very closely to that of the previous year. Its appointments were similar, and the officers presiding were the same, and the program, as usual, covered a variety of topics, each session being confined as nearly as possible to various phases of one subject. The session differed, however, in one respect materially from the year before, and that is in the matter of attendance. The first session of last year's meeting found 140 present, and at the first session this year there were 225. This comparative difference continued throughout the meetings. As the gathering of the year before was the largest the society had ever held, the one just closed is also now considered the largest. With a membership of over 1,000 and the attendance at the annual meeting ranging from 200 to 300 at each session, the organization may fairly be considered very successful.

The fruit exhibit filled the two rooms adjoining prepared for that purpose and made a beautiful show, the plates shown running up into the hundreds. The special feature of this exhibit was the show of seedling apples, to draw out which unusual premiums had been offered and in such a way that each variety of merit was certain of securing a premium. The result of this was an exhibit of twenty varieties of early winter seedling apples and fourteen varieties of late winter seedling apples. Amongst them were some very handsome apples and also some of very decided merit and value as commercial varieties. The result of this show of seedlings as apparent in the division of premiums allowed will be found in the list of premiums following this report.

A number of visitors were present with us as usual, among whom may be noticed the names of:

J. L. Herbst, Secretary Wisconsin State Horticultural Society, Sparta, Wis.

Z. K. Jewett, Sparta, Wis.

A. J. Philips, West Salem, Wis.

Charles G. Patten, Charles City, Ia.

C. H. True, Secretary N. E. Iowa Society, Edgewood, Ia.

Dr. F. M. Powell, representing Iowa State Society, Glenwood, Iowa.

Prof. N. E. Hansen, Secretary S. D. Society.

All the officers of the society for 1901 were re-elected without opposition.

In looking over the various sessions of the society, the one which seems to the writer to have been of the largest interest to those in attendance was the session Friday forenoon, covering the subject of "Commercial Orcharding." An observer has stated, and I believe with truth, that the attendance on that occasion was the best representative horticultural audience ever gathered at a similar meeting in our state.

The program, with the exception of a few of the shorter reports, was fully completed, and with a single exception every assignment on the program was ready in its place. The meeting closed with a feeling that the work of the session was most happily finished. The last hour was occupied with short speeches, two-minute talks, songs and recitals of personal experiences and anecdotes, winding up with "Auld Lang Syne," in which the large audience joined, taking hold of hands and singing together in a hearty chorus. So closed the thirty-fifth session of our society.

The banquet should receive special mention, since, as usual, it stands near the head of the entertaining features of the meeting. The program was as follows:

Toastmaster, Pres. W. W. Pendergast.

1. *Grace.* REV. T. E. ARCHER, Minneapolis.
2. *Brothers in affliction—the legal luminary and the tree pedlar.* A. B. CHOATE, Minneapolis.
3. *"Truth crushed to earth will rise again."* CLARENCE WEDGE, Albert Lea.
4. *In search of truth—Was the garden of Eden really located in Minnesota?* PROF. WM. ROBERTSON, St. Anthony Park.
5. *Song,* ROY UNDERWOOD.
6. *'Tis better to be sinned against than sinful—The commission merchant a propitiation for the sins of many.* LEVI LONGFELLOW, Minneapolis.
7. *The liviest thing on record—A Minnesota spring from the nurseryman's standpoint.* J. P. ANDREWS, Faribault.
8. *The Minnesota State Horticultural Society—We toast ourselves with becoming modesty.* FRANK YAHNKE, Winona.
9. *The Gopher and Badger lie down together—on occasion.* A. J. PHILIPS, West Salem, Wis.
10. *Song.* J. M. UNDERWOOD, Lake City.
11. *The Men's Auxiliary—what we are coming to.* G. F. BRATON, Minneapolis.
12. *Things horticultural and otherwise in countries not our own.* REV. T. E. ARCHER, Minneapolis.
13. *"In Memoriam"—a finger board pointing the way to duties unperformed.* OLIVER GIBBS, Prescott, Wis.

The speeches being impromptu and of a character especially entertaining rather than horticultural, are not reproduced in our publication. An orchestra furnished suitable music.

That we had a good time is the testimony of every one who had an opportunity to know anything about it.

PREMIUMS AWARDED, ANNUAL MEETING, 1901.

COLLECTION OF APPLES.

Exhibitor.	Premium.	Amount.
Jewell Nursery Co., Lake City	First	$6.00
J. A. Howard, Hammond.	Second	4.00
W. L. Parker, Farmington	Third	2.00

APPLES KEPT IN COLD STORAGE.

Varieties.			
Anisim	H. M. Lyman, Excelsior	Second	.25
Christmas	"	First	.50
Kaump	"	Second	.25
Lyman's Prolific	"	First	.50
Breskovka	D. Cook, Jeffers	First	.50
Tetofsky	"	Second	.25
Yellow Transparent	"	Second	.25
Blushed Calville	"	First	.50
Hyslop	H. H. S. Rowell, Minneapolis	Second	.25
Tonka	Thos. Redpath, Wayzata.	First	.50
Peerless	"	First	.50
Pride of Mpls	"	First	.50
Gibb	Wm. Oxford, Freeburg.	First	.50
Transcendent	Wm. Oxford, Freeburg.	First	.50
Florence	"	Second	.25
Ostrokoff	P. H. Perry, Excelsior.	First	.50
Peter	"	Second	.25
Florence	"	First	.50
Whitney's No. 20	"	Second	.25
Northwestern Greening	Jewell Nursery Co., Lake City	Second	.25
Longfield	"	Second	.25
Walbridge	"	First	.50
Malinda	"	Second	.25
Yellow Transparent	"	First	.50
Dartt	"	First	.50
Wolf River	"	First	.50
Wealthy	"	Second	.25
Okabena	"	First	.50
Transcendent	"	Second	.25
Martha	"	First	.50
Pride of Minneapolis	"	Second	.25
Long Arcade	"	First	.50
Peerless	"	Second	.25
Antonovka	"	Second	.25
McMahon	"	First	.50
Harding	"	First	.50
Hibernal	"	Second	.25
Grundy	"	First	.50
Brett	W. L. Parker, Farmington.	First	.50
Fameuse	"	First	.50
Martha	"	Second	.25
Duchess	"	First	.50
Rollin's Pippin	"	Second	.25
Cross	"	First	.50
Patten's Greening	"	First	.50
Haas	"	First	.50
Charlamoff	"	First	.50
Judson	"	First	.50
Anisim	"	First	.50
Okabena	"	Second	.25

Varieties.	Exhibitor.	Premium.	Amount.
Minnesota	W. L. Parker, Farmington.	First	.50
Northwestern Greening	"	First	.50
Whitney	"	First	.50
Early Strawberry	"	First	.50
Virginia	"	Second	.25
Walbridge	"	Second	.25
Tetofsky	A. A. Day, Farmington.	First	.50
Yellow Sweet	"	First	.50
Swaar	J. A. Howard, Hammond.	First	.50
Gideon	"	First	.50
Haas	"	Second	.25
Longfield	"	First	.50
Wealthy	"	First	.50
Plumb's Cider	"	First	.50
Ben Davis	"	First	.50
Ben Davis	O. C. Meaker, Excelsior.	Second	.25
Yellow Sweet	J. A. Howard, Hammond.	Second	.25
Kaump	"	First	.50
Antonovka	"	First	.50
Rollin's Pippin	"	First	.50
Beecher's Sweet	"	First	.50
Gilbert	"	First	.50
Repka	"	First	.50
Rollin's Prolific	"	First	.50
Malinda	"	First	.50
Charlamoff	"	Second	.25
McMahon	"	Second	.25
Early Strawberry	"	Second	.25
Minnesota	"	Second	.25
Peter	"	First	.50
Duchess	"	Second	.25
Virginia	"	First	.50
Red Astrachan	"	First	.50
Hyslop	"	First	.50
St. Lawrence	"	First	.50
Brett No. 1	"	Second	.25
Fameuse	"	Second	.25
Gideon No. 6	"	First	.50
Patten's Greening	"	Second	.25
Grundy	R. H. L. Jewett, St. Paul.	Second	.25
Hibernal	C. W. Sampson, Excelsior.	First	.50
Red Anis	Jewell Nursery Co.	First	.50
Long Arcade	"	First	.50
Iowa Beauty	"	First	.50
Shipper's Pride plums	"	First	.50

C. E. OLDER, Judge.

APPLES NOT KEPT IN COLD STORAGE.

Minnesota	H. H. Pond, Bloomington.	First	.50
Malinda	D. Cook, Jeffers.	First	.50
Charlamoff	"	First	.50
Grundy	"	First	.50
Judson	"	Second	.25
Cross	"	First	.50
Pride of Minneapolis	Thos. Redpath, Wayzata.	First	.50
Peerless	"	Second	.25
Hibernal	"	Second	.25
Ben Davis	Wm. Oxford, Freeburg.	Second	.25
Walbridge	"	First	.50
Northwestern Greening	"	Second	.25
Oxford Orange	"	First	.50

Varieties.	Exhibitor.	Premium.	Amount.
Wealthy	P. H. Perry, Excelsior.	Second	.25
Peter	"	Second	.25
Peerless	"	First	.50
Cross	"	Second	.25
Ostrokoff	"	First	.50
Anisim	"	Second	.25
Anisim	W. L. Parker, Farmington.	First	.50
Patten's Greening	"	First	.50
Repka Malenka	"	First	.50
Haas	"	First	.50
Malinda	"	Second	.25
Kaump	J. R. Cummins, Washburn.	First	.50
Fameuse	Frank Yahnke, Winona.	Second	.25
Tallman Sweet	S. A. Alling, Homer.	Second	.25
Longfield	Thos. Redpath, Wayzata.	Second	.25
Longfield	J. A. Howard, Hammond.	First	.50
Haas	"	Second	.25
Hibernal	"	First	.50
Wolf River	"	First	.50
Ben Davis	"	First	.50
Golden Russet	"	First	.50
Hyslop	"	First	.50
Patten's Greening	"	Second	.25
Northwestern Greening	"	First	.50
Kaump	"	Second	.25
McMahon	"	First	.50
Martha	"	First	.50
Peter	"	First	.50
Giant Swaar	"	First	.50
Talman Sweet	Ditus Day, Farmington.	First	.50
Fameuse	"	First	.50
Walbridge	Adolph Anderson, Renville.	Second	.25
Judson	H. H. Heins, Lydia.	First	.50
Maple	"	First	.50
Phoebe	"	First	.50
Hyslop	H. H. S. Rowell, Minneapolis.	Second	.25

O. M. LORD, Judge.

PECK OF WEALTHY.

P. H. Perry.	Third	
Jewell Nursery Co.	Second	1.00
J. A. Howard.	First	2.00

C. E. OLDER, Judge.

EARLY WINTER SEEDLING APPLES.

Exhibitor.	Amount.
H. M. Lyman, Excelsior	1.52
"	1.57
"	1.18
D. F. Akin, Farmington	.84
"	.84
"	1.26
Peter Keilty, Forest City	1.10
Jewell Nursey Co., Lake City	.84
W. L. Parker, Farmington	1.43
J. R. Cummins, Washburn	.92
Frank Yahnke, Winona	1.01

Exhibitor.	Amount.
S. A. Alling, Homer	.84
Jos. Holm, New Ulm	.67
Ditus Day, Farmington	.84
A. Wilfert, Cleveland	.84
D. F. Akin, Farmington	.84
"	1.01
Jewell Nursery Co., Lake City	1.35
S. A. Alling, Homer	1.10

LATE WINTER SEEDLING APPLES.

D. F. Akin, Farmington	3.68
"	2.40
"	2.20
O. M. Lord, Minnesota City	3.35
Hans A. Clausen, Sleepy Eye	4.05
W. G. Cowan, Mankato	4.05
S. A. Alling, Homer	3.78
"	4.30
Christian Fink, Victoria	4.61
Walter Lindquist, Winthrop	3.68
Christian Fink, Victoria	4.00
W. E. Fryer, Mantorville	1.00

WYMAN ELLIOT,
CLARENCE WEDGE,
SAM'L B. GREEN,
Judges.

GRAPES.

Agawam	Gust Johnson, Excelsior.	First	.75
Iowa	"	First	.75
Martha	"	First	.75
Pocklington	"	First	.75
Concord	"	First	.75
Salem	"	First	.75
Plate of quinces	W. E. Fryer, Mantorville.	First	1.00

R. S. MACKINTOSH, Judge.

FLOWERS.

Collection of plants	E. Nagel & Co.	First	5.00
Bouquet	"	First	2.00

HARRIET K. EVES, Judge.

Bagging Grapes.—This pays for home use when you want the best you can get. Bagged bunches are much finer, ripen more evenly, have more bloom and are better in every way, but possibly a few days later in ripening. Thin skinned varieties, especially, like Concord, are very much improved. Buy two-pound manilla bags such as grocers use. These bags last two years and cost only a few cents a hundred. A paper of pins are also required. Slip the bag over the bunch, make a double fold of the top and stick a pin through, and there you are until the bunches are ripe. The grapes should be bagged when they are about the size of small shot, but later will do, although the larger they are the more trouble they are to bag.

PRESIDENT'S ANNUAL ADDRESS.

W. W. PENDERGAST, HUTCHINSON.

Fellow Members of the Minnesota Horticultural Society:

Ladies and Gentlemen—Time steals by with muffled feet, giving no alarm at his approach, no token of his presence, no bugle blast to note his departure. He takes no heed of the weather or the seasons. Winter's cold tempests, summer's dissolving heat, the ethereal mildness of spring, are all alike to him. He moves as

"Noiselessly as the springtime her crown of verdure weaves,
When all the trees on all the hills open their thousand leaves;
Noiselessly as the daylight comes when the night is done,
And the crimson streak on ocean's cheek grows into the great sun."

—still as the glittering host above our heads at nightfall, which go on "treading their eternal circles," having uttered no sound since that glorious morning when all the stars sang together in celestial concord. Today we know that for the past twelve months he has been quietly gliding by, because we find our horologe set one year ahead of where it stood at the time of our last annual meeting. We know it by the fact that all of our ornamental and our shade trees, our vines and shrubbery, have taken on another season's growth; we recognize it by the deepening furrows on our faces; we sorrowfully realize it when we look around in vain for the revered forms of our brethren and fellow workers Harris, Cross, Mackintosh and Lugger, who have fallen victims to his all-devouring scythe and been spirited away to the realms of shade "beyond the reach of mortal ken until He before whom all creatures bow and to whom all nature listens shall speak, and all who ever lived shall hear; to whom the yawning graves shall give up their dead, when the sun shall sicken and the earth and its isles shall languish and the heavens be rolled together like a scroll." We ought also, if we have been wise, faithful and diligent, to be able to mark the advance of time by the successful culmination of plans which we have conceived and carried out, by the good work which we have done. We should have some sheaves to show from the harvest we have gathered. Have we better trees, of better kinds? Do they show better judgment in the pruning, cultivating and general management? Have the fields and home a cleaner, tidier look? Is thrift apparent everywhere? Would the place command a higher price than it could have been sold for a year ago?

"Have we worked for some good, be it ever so lowly?
Have we worked?—for all labor is noble and holy.
Have we let our good deeds be our prayer to our God?"

If so, then we may say that though the year has gone it has

left its mark upon us for good; it has given us a broader and more valuable experience; kindled higher and nobler aspirations and enlarged our capacity for usefulness. If the lesson taught is not wasted upon indocile pupils, the rest of our lives will be more serviceable and, consequently, purer and sweeter.

When we consider that this is only the thirty-fifth annual meeting of the Minnesota State Horticultural Society, all must admit that the average yearly work accomplished has been most extraordinary. But little more than a third of a century has elapsed, yet the results already attained are greater than the mere "lookers-on in Venice," and even some of our own members, thought could be brought about in a full hundred years. The success already achieved should spur us on to still greater efforts in the future. When a boy has distinguished himself in school by his diligence, faithfulness, untiring effort and accurate scholarship, it is safe to predict for that boy a brilliant future. The coming man is he who has laid deep and strong the foundations of the platform on which he is to stand.

Some things we need are, to a great extent, wanting. Who is to take the place of the old stagers when we are ready to turn the rudder and the oars over to more stalwart hands? It is true we have a large number whose locks have not been whitened by the snows of many winters yet. We must plan to get more young blood into our organization. They will be benefited more by this work than we.

Every member of our Agricultural School and College should join this society. They would be welcomed with open arms, and the practical education they would pick up here would be of the highest value to them while pursuing their studies and brighten them up all through their lives by keeping their thoughts busy upon the best plans for carrying on their work so as to yield the largest and most satisfactory returns, recognizing the fact that permanent success in life does not depend on the amount of money secured from the current year's harvest. They will be happy in producing some luxury, the demand for which fixes its price at a point far above its value as an article of food simply and, at the same time, reduces the transportation charges to a minimum, while preserving the fertility of the soil. The growing of fruit seems to offer a partial solution to the problem which confronts us. The specific plans for this work are what we have been for years laboring upon with marked success, and these same plans we shall be exceeding glad to help the younger ones carry to maturity. That they may be able to surpass us is the sincere desire of every old member of the Minnesota State Horticultural Society.

REPORT OF COMMITTEE ON PRESIDENT'S ADDRESS.

We, your committee, congratulate this society on the very able address of our president and most heartily endorse the sentiments expressed therein, especially that portion of it which refers to the students of our State Agricultural College, with whom we have mutual interests which can be better furthered by co-operation.

Respectfully submitted,

Alfred Terry,
C. A. Sargent,
D. M. Mitchell.

ANNUAL REPORT OF EXECUTIVE BOARD, 1901.

WYMAN ELLIOT, CHAIRMAN, MINNEAPOLIS.

We have had a quiet, successful year, with very marked improvement in membership, which at the present time numbers over one thousand. This has been accomplished only by the persistent effort of our friends and the zealous work of our secretary.

We have had under discussion the subject of acquiring the Peter M. Gideon farm and orchards for an experiment station for pomology, but there is now no immediate probability of accomplishing this object, and unless some of our rich friends are interested we may never attain to its possession.

The Peter M. Gideon Memorial Fund has been considered, as recommended at our last annual meeting, and a committee consisting of Messrs. Green, Elliot and Latham has been appointed by the executive board to devise some practical plan for raising the necessary means for that purpose. That committee has prepared a prospectus, of which they are having printed five thousand, which are being sent to all lovers of horticulture as far as known. We have had great difficulty in procuring a good type of the Wealthy apple suitable for an electrotype worthy a place in the proposed memorial volume, that is to be sent out to contributors to this fund.

The ranks of your executive board have been broken by the death of our brother and co-worker, John S. Harris, which is a great loss to our society and the cause of horticulture. Six members of our society, Messrs. Underwood, Lord, Widmoyer, Kimball, Latham and Elliot, attended his funeral. All felt at that time most keenly his taking away from so useful a field of work.

The death of Mr. Harris has necessitated the appointment of a new member on the executive board, and Hon. A. K. Bush has been selected to fill the unexpired term of Brother Harris.

Frank I. Harris was appointed superintendent of his father's trial station, and S. B. Green, O. M. Lord and F. W. Kimball the committee on seedlings.

Our library is fast filling up, over three hundred volumes having been added the past year, and the secretary feels the need of enlarged quarters, but this will cause an additional expense in rent and bookcases, and the society should decide at the present time whether we shall make a change to new rooms. Special interest the past years in seedling apples has made it apparent to the committee that larger premiums should be offered, and accordingly we have expended sixty dollars in this way, hoping to give added attraction in the development of apples adapted to the climatic conditions of our state.

SECRETARY'S ANNUAL REPORT, 1901.

A. W. LATHAM, SECRETARY.

The year closing with the present annual meeting has been a prosperous and successful one for the society which I have the honor of serving as secretary.

The membership has continued to increase, until now the united roll of life and annual members is just above the coveted number of one thousand. At the date of writing the total number of annual members for 1901 stands at 895. There were on this roll last year 803, making an increase the present year of 92. The life roll contains now 100 names; to make up this number there have been added the past year 15 names; two to the honorary life roll, viz.: J. M. Underwood, of Lake City, and A. K. Bush, of Dover, Minn., and 13 to the paid roll. The names of these new members are as follows:

C. L. Larson, Winthrop, Minn.
Wm. L. Dickerson, Richland, S. D.
Chas. F. Schaupp, Hart, Minn.
Wm. H. Dunwoody, 52 S. Tenth St., Minneapolis, Minn.
C. F. Wheeler, 602 Oneida Block, Minneapolis, Minn.
T. B. Macauley, Montreal, Canada.
Hamlin V. Poore, Bird Island, Minn.
Ellsworth Scranton, Montrose, Minn.
Daniel Smiley, Mohawk Vale, N. Y.
A. B. Lyman, Excelsior, Minn.
C. M. Loring, 102 Clifton Ave., Minneapolis, Minn.
David Secor, Winnebago City, Minn.
C. C. Hunter, Minneapolis, Minn.

From this roll are to be taken the names of three members who have been called from our ranks by death during the past year:

Wm. Mackintosh, Langdon, Minn.
John S. Harris, La Crescent, Minn.
H. W. S. Cleveland, Chicago, Ill.

The result of these changes in the life roll have changed the figures to 100, as above stated. There are besides six honorary

short-term members on our roll. These various classes added together make a total of 1001. One thousand members, the number to which we have as an association for a number of years hoped to attain, is approximately as large a membership roll as can be carried to advantage with the present printing resources. This statement is not made to discourage from further efforts in increasing the membership, as we shall in some way provide for the necessary printing required to carry on this increased work.

The past year the Farmers' Institute has contributed 73 new members to the society, as against 151 in the previous year; the falling off being accounted for by the absence of Mr. A. K. Bush, the lecturer on horticulture at the Farmers' Institute, who has so zealously promoted this work. his presence being required in the state legislature, of the lower house of which he is a member. I understand that Mr. Bush is to be with the Farmers' Institute again this winter, and we shall expect to hear from him. The Farmers' Institutes furnish a means of disposing to the best advantage of any surplus magazines belonging to the society, and besides this we distribute there a sufficient number of fruit lists of the society to furnish one copy to every attendant at the institute who desires it.

There has been during the past year something of a falling off in the returns from the local societies: the Southern Minnesota Society return thirty-four memberships; the Meadow Vale Horticultural Club at Elk River fourteen; the South Dakota Society, which affiliates with us, thirty; making a total of seventy-eight from this source. I have not the exact figures at hand of the year before, but the aggregate is somewhat less.

There have been three more applications during the year for the privilege of competition in the $1,000 prize offered by this society for seedling apples. The chairman of the committee who has this matter in charge will doubtless report more fully in regard to it.

A matter which has occupied the attention of the secretary to some extent during the year has been the Gideon Memorial Fund. Material has been secured to make up the book which is to be printed in connection with securing this fund, including in a general way a sketch of the life of Mr. Gideon, description of his seedling apples, the words of his fellow members at memorial exercises and autograph letters from something near a dozen of the more prominent pomologists of the country. The committee having this matter in charge were unable to secure a good specimen of the "Wealthy" last winter from which to make the needed colored plate to go into this volume, and indeed the results of the efforts in the direction of

getting a plate since we have been able to secure the necessary fruit have not been very successful. So far the proofs submitted have not come up to the high standard required, but we are in hopes yet to attain our purpose so that the book may be issued the coming year, if the demand for it shall warrant it. The issuance of the prospectus to precede this book has been postponed until at this period of the year, just before the annual meetings of the various state societies, when it was hoped it would receive a more general and careful consideration. This prospectus is now being sent out, and we are awaiting results with some solicitude.

The library of the society has received during the past year a large number of additions, about 275 volumes having been recorded in the register. With a few exceptions, these books have come to us in the way of exchanges, being horticultural and experiment station reports. The late John S. Harris devised to the society a number of valuable volumes, the most valuable of which is a register of varieties of apples and plums growing in the state and is the work of his own hands. Aside from the worth of its contents, this book is most highly prized on account of its being the personal work of the donor. Among the books of special interest donated by Mr. Harris is a large volume entitled "Forest Trees, Fruits, Etc.", printed in London in 1706. The book is in a good state of preservation, notwithstanding its extreme age. "The American Gardeners' Calendar," under date 1806 is also an interesting work. In the list of books from Mr. Harris are also thirteen volumes of the "Horticulturist," from 1861 to 1875, and eight volumes of the "Gardeners' Monthly," 1873 to 1877. These books from Mr. Harris' library will be gathered in a bookcase by themselves and suitably inscribed.

The finances of the society, I am pleased to report, are in a very flourishing condition, notwithstanding the necessarily large outlays on account of the extent of the work being done. Following is a statement of the receipts and disbursements in connection with the secretary's office during the past year:

RECEIPTS.

Advertisements	$162.25
Life membership fees	150.00
Minn. State Fair	8.00
Gideon Mem. Fund	10.03
Express charges repaid	5.35
Books sold	15.30
Railway tickets sold	4.25
Programs sold	6.50
Annual Membership fees, 1897	1.00
Annual Membership fees, 1901	731.00
Annual Membership fees, 1902	163.00
	$1,256.68

EXPENDITURES.

Exp. Executive Board	$12.65
Exp. Supt. Trial Stations	14.75
Exp. Delegates at Annual Meeting, 1900	18.59
Ry. Tickets to make 100 for Annual Meeting	29.52
Reporting meetings	109.40
Premium books	58.25
Gideon Mem. Fund	10.58
Exp. Delegates abroad	44.55
Discts. on An. Memberships, Local Societies, etc	97.75
Exp. Banquet	20.75
Exp. Vice Presidents	14.53
Asst. Librarian	10.00
Sund. Exp. An. Meeting, 1900	37.70
Exp. send'g plant prems	13.60
Directing and mailing magazines	14.25
President's salary	25.00
Printing	112.00
Postage	147.05
Telegrams	.46
Telephone	25.30
Express	97.45
Office rent	144.00
Insurance	8.00
Ry. Agent at An. Meeting, 1901	11.00
Gas, lighting office	1.85
Photos	1.50
Engravings for magazine	53.67
Envelopes for magazine	51.70
Ribbon for badges (An. Meeting)	4.50
Expenses J. S. Harris's funeral	12.34
Office supplies	6.15
Expenses summer meeting, 1902	11.67
Awnings for office	4.27
Library, books, etc	20.81
Assistance in office	38.07
Sundries	4.00
	$1,287.66

GENERAL FINANCIAL STATEMENT.

1901.	Total Receipts of office 1901	$1,256.68
June 19.	Rec'd from Society Treasurer	$960.70
Dec. 2.	Rec'd from Society Treasurer	326.96
	Deposited in Hennepin County Savings Bank	540.14
		$3,084.48
	Total Expenditures from office in 1901	$1,287.66
June 19.	Paid to Society Treasurer	843.65
	Bal. on hand	953.17
		$3,084.48

GIDEON MEMORIAL FUND.

Amount collected to date	$99.00
Amount expended to date	10.03
Bal. on hand	$88.97

I shall not weary you with references to the largeness of the horticultural developments in our state during the past year or the most encouraging prospects which are before you; these things will be touched upon at length undoubtedly by other officers of the

society, and in the main are well known to the members of the organization. We have doubtless every reason to be encouraged with the outlook in the work of the association, and shall be able from the advanced position we occupy to increase in a large degree, no doubt, the efficiency of our work in the future.

ANNUAL REPORT OF THE TREASURER FOR 1901.

A. B. LYMAN, EXCELSIOR.

Receipts.

1900.				
Dec.	4.	Balance on hand		$762.44
		A. W. Latham, Receipts of Secretary's office, June 20th to Dec. 3d, 1900	$367.05	
1901.				
Feb.	21.	State Treasurer, semi-annual allowance	750.00	
June	29.	A. W. Latham, Receipts of office from Dec. 3, 1900, to June 19, 1901	843.65	
Sept.	2.	State Treasurer, semi-annual allowance	750.00	$2,710.70
				$3,473.14

Disbursements.

1900.			
Dec.	3.	Order No. 87, Exp. Secy. office from June 20 to Dec. 3, 1900	$363.16
	3.	Order No. 88, Secy. Salary 4th qr., 1900	225.00
	3.	Order No. 89, Premiums winter meeting, 1900	110.75
	7.	Order No. 90, H. M. Lyman, Treas., Salary 1900	25.00
	10.	Order No. 91, J. S. Harris, Exp. Ex. Board.	15.55
	11.	Order No. 92, G. W. Beach, Rent Congregational Church for Annual Meeting	60.00
1901.			
March	1.	Order No. 93, A. W. Latham, Salary 1st. qr. 1901	225.00
June	1.	Order No. 94, A. W. Latham, Salary 2d qr. 1901	225.00
	29.	Order No. 95, Exp. Secy. office from Dec. 3, 1900, to June 19, 1901	960.70
Sept.	1.	Order No. 96, Secy. Salary 3d qr. 1901	225.00
		Premiums summer meeting, 1901	78.50
Dec.	2.	Balance on hand	959.48
			$3,473.14

LIST OF FRUITS.

Adopted by the Minnesota State Horticultural Society, Dec. 6, 1901, for the guidance of planters in Minnesota:

APPLES.

Of the first degree of hardiness for planting in Minnesota: Duchess, Hibernal, Charlamoff, Patten's Greening.

Of the second degree of hardiness: Wealthy, Longfield, Tetofsky, Malinda.

Varieties for trial: Okabena, Peerless, Repka Malenka, Anisim, Yellow Sweet, Kaump, Brett, Blushed Calville, Northwestern Greening, McMahon, Wolf River, Yellow Transparent.

CRABS AND HYBRIDS.

Best for general cultivation: Virginia, Martha, Whitney, Early Strawberry, Minnesota, Sweet Russet, Gideon No. 6, Brier Sweet.

Varieties for trial: Dartt, Pride of Minneapolis, Crampton's No. 3, Lyman's Prolific, Faribault.

PLUMS.

Best for general cultivation: DeSoto, Forest Garden, Weaver, Cheney, Wolf, Rollingstone, Wyant, Surprise.

Most promising varieties for trial: Ocheeda, New Ulm, Stoddard, Mankato, Aitkin, Brittlewood.

GRAPES.

In order of their ripening: Moore's Early, Worden, Janesville, Brighton, Delaware, Agawam, Concord.

RASPBERRIES.

Red varieties: Turner, Marlborough, Cuthbert, Brandywine, Loudon, King.

Black and purple varieties: Ohio, Palmer, Nemaha, Gregg, Schaffer, Older, Souhegan, Columbian, Kansas.

BLACKBERRIES.

Ancient Briton, Snyder, Badger.

CURRANTS.

Red Dutch, White Grape, Victoria, Stewart, Long Bunch Holland, North Star.

GOOSEBERRIES.

Houghton, Downing, Champion.

STRAWBERRIES.

Pistillate: Crescent, Warfield, Haverland.

Staminate: Bederwood, Enhance, Lovett, Splendid, Mary, Clyde.

NATIVE FRUITS.

Valuable for trial: Dwarf Juneberry, Sand Cherry, Buffalo Berry.

DISCUSSION.

Mr. R. H. L. Jewett: The report specifies "first degree of hardiness" and "second degree of hardiness." Is that the only requisite? If that is so there are some other trees left out. Why is the Peerless left out of the first and second list and put in for trial?

Mr. Clarence Wedge: The Peerless is not disparaged at all by the committee as to its hardiness, but it is put in with others of a similar degree for trial on the trial list. It has no stigma of lack of hardiness.

Mr. O. F. Brand: I would like to inquire of the committee why the Patten's Greening is on the first list and the Peerless left off. The Patten's Greening has never passed through a trial winter as a fruiting tree in this state. There was only one tree outside the state, and that was not a bearing tree, in 1884. I do not know anything about the Patten's Greening in the state, but I do know something about the Peerless, because the original tree had borne nine bushels of apples in 1884, the year before the hard winter, and in 1886 it had eleven bushels. In 1884, the Patten's Greening had never borne more than two bushels of fruit, taking Mr. Patten's word for it. It has only a few leaves on it, and you can see every apple on the tree, and it makes a great showing of fruit; but the Peerless has many leaves and hides its fruit, and it looks as though there were but a few apples on the tree. I think this committee is doing an injustice in keeping out varieties like the Peerless and Okabena from the first list and putting them in the trial list, varieties that have beeen planted as long and extensively as they have.

Prof. Green: We discussed very carefully this year the matter of putting the Peerless and Okabena on the list of first degree of hardiness. Mr. Brand asks why the Patten's Greening was put on. It was put on two years ago because in the opinion of the committee and in the opinion of the society it had proved hardy enough to warrant it. The reason why the Peerless and Okabena were not put on this year was simply because the committee did not want them to be in the second list, and they were not quite ready to put them on the first list. The second list is of "the second degree of hardiness," and we felt it was better for those two apples to stay where they are, and for next year the committee proposed this: that instead of having our fruit list made up as it is now, which I do not like, to take up those varieties one by one and give a dissertation of

each one, stating its merits. We did not feel that there was time to do it this year and have the society go over the list carefully. We had seen enough in our own minds, and while we felt that the Okabena and Peerless did not have as good a position as they ought to have we did not feel like putting them on the second degree of hardiness list, and we did not have time to carry out the idea suggested. We agreed to give them a better place next year.

Mr. O. F. Brand: I would very much like to have the committee add those few words to the report, that the Peerless and Okabena do not occupy the position they merit.

Prof. Green: I would not want to put it in just those words. I think we should be willing to state that the Peerless and Okabena have been so well tried that they should have a better position than on the trial list.

Mr. R. H. L. Jewett: I know of other trees that have died when the Peerless has come through without a bud being injured. I thought the question of hardiness was the main question, as indicated by the report of the committee.

Mr. Clarence Wedge: It seems to me this is all going in in a very good form, as our reporter has taken down the whole discussion. The idea is to keep that list clean with as little comment as possible, and another year we propose to put a little more time upon it, and at that time we will endeavor to give the Peerless everything that it deserves in every way.

Mr. Wyman Elliot: I think if we attempt to take up each variety by itself and discuss it we will not get through with the fruit list this afternoon. I think it is a very good and satisfactory list. I can criticize some things, but I am willing to forego that and accept the list as it is.

Late Strawberries for Home Use.—Geneva March, Iowa.—The strawberry season may in a great measure be prolonged by uncovering at different periods and having the latest varieties planted on a northern slope. But there is yet another way. Take a bed that has borne fruit early, and before all the small berries are off, mow the vines and let them lay about three days, then burn the patch over.

In a few weeks it should be green again with the fresh sprouts, and then due attention should be given to fertilizing and watering. The plants must be kept growing from the start. In about two months, or about Sept. 1, the second crop may be picked. It will not be so plentiful as the first, but of good quality. It may be necessary to cover the vines with canvas if early frost threatens.—Orange Judd Farmer.

REPORT OF COMMITTEE ON PACKAGES AND MARKETING.

(Adopted at Annual Meeting, 1901, Minnesota State Horticultural Society.)

Your committee met with a like committee from the commission merchants of the city, consisting of Messrs. Palmer, Collins, and Gamble. We unite in recommending the sixteen quart berry crate filled with quart boxes for plums such as DeSoto, Rollingstone, Forest Garden and varieties of similar size; the California plum package for Surprise, Hawkeye, Stoddard and similar large sizes, which latter should be carefully picked, packed and faced.

The commission men are not favorably disposed toward a bushel crate or box for apples for the Minneapolis market and adjacent territory—except possibly in seasons of great scarcity. We recommend the use of new barrels of standard size for all apples. When filled these should be faced at each end and honestly packed with sound, smooth, uniform fruit. Unsound fruit and culls are practically worthless on any market.

Red crab apples, such as Hyslop and varieties of similar season, size and color, are always in demand at good prices, with the supply decreasing while the demand is on the increase. Crab apples should be double faced.

Duchess sell and handle best when of about full size and but partially colored, and will net the grower more money at that size than a crop of fully matured fruit sent to any distant market, especially in seasons of abundance.

The Wealthy apple commands the best price of any Minnesota apple and is always in demand.

Sugar barrels, boxes and other second-hand packages are dear at any price when compared with new, clean apple barrels. The bushel basket with board covers, which will cost about 15 cents each in quantities, makes a very desirable package for apples shipped to a country trade.

Tomatoes and other perishable vegetables afford no profit to the grower when shipped to the Twin City markets.

Clarence Wedge, Chairman.
Dewain Cook.
A. K. Bush.
Wyman Elliot.

ANNUAL MEETING, 1901, MINNESOTA STATE FORESTRY ASSOCIATION.

G. W. STRAND, SECRETARY.

The twenty-sixth annual meeting of the Minnesota State Forestry Association was held in Minneapolis Thursday afternoon, Dec. 5, 1901, in joint session with the Horticultural Society. There was a large attendance, and more interest was manifested than for some time past, which was indeed an encouragement to those interested in forestry matters.

Pres. C. M. Loring called the meeting to order, and spoke briefly on forest destruction and its consequences, and of the opportunity Minnesota now offered if the government could be prevailed upon to act and place the forest areas still in its power under a practical forestry system. Following this, a resolution was introduced and adopted, petitioning our congressmen to look into this matter.

"The Present Status of the Park Question" was ably given by Mrs. Florence Bramhall, of St. Paul, showing that she had and was giving the subject much thoughtful study.

Prof. S. B. Green spoke in favor of the establishment of "A Special Course in Forestry in the University," which he demonstrated the necessity of, and believed it would be instituted in the near future.

The secretary's report showed that owing to lack of funds not much work had been attempted or accomplished by the association during the year; but that it was still in position to and could be of great service in aiding to obtain the establishment of a rational system of forestry for the state, even as a voluntary organization.

A committee of three was appointed to draft suitable resolutions as a mark of respect and tribute to the memory of our former co-workers, the late Capt. J. N. Cross and John S. Harris.

The following officers were elected for the ensuing year:

President, Chas. M. Loring, Minneapolis; Secretary and Treasurer, Geo. W. Strand, Taylors Falls; Vice-Presidents—1st District, Wm. Somerville, Viola; 2d District, C. E. Older, Luverne; 3d District, O. F. Brand, Faribault; 4th District, W. P. Allen, St. Paul; 5th District, S. M. Owen, Minneapolis; 6th District, Asa Paine, Carlton; 7th District, O. A. Th. Solem, Halstad; Executive Committee—Wyman Elliot, Minneapolis; A. W. Latham, Minneapolis; Prof. S. B. Green, St. Anthony Park; Prof. F. D. Tucker, St. Anthony Park; D. T. Wheaton, Morris.

PRESIDENT'S ANNUAL ADDRESS, MINNESOTA STATE FORESTRY ASSOCIATION.

C. M. LORING, PRESIDENT.

Gentlemen of the State Forestry Association:—

It is little more than forty years since Minnesota was admitted to the sisterhood of states, and then the population was less than that of the city now clustered around its largest waterfall. The inheritance which came to this people was one so rich that its value could hardly be appreciated. In area it was larger than that of the six New England states, and equal to that of England and Scotland combined, embracing fertile prairies, grand rivers, beautiful clear water lakes surrounded with groves of hardwood timber, and at the head of the waters of the great river which extends to the ocean, and along its tributaries, forests of pine and other valuable timber which seemed so vast as to be inexhaustible. The value of these rich possessions soon attracted to the state emigrants from various sections of our own and other countries, and along with the development of our agricultural and manufacturing resources, as is usual in all countries, the destruction of the grand forests began in the most reckless and profligate manner, continuing until the present day; and now, in alarm at the inevitable result of this wanton destruction, thoughtful citizens are striving for ways and means to avert the disaster which has befallen other peoples through the same source. Citizens of other countries and other states have witnessed their streams run dry, lands that were once fertile become arid plains through floods at one season and lack of moisture at others, and efforts which have met with a very small degree of success made to reforest the denuded territory. Is it not better for us to preserve and economically use what little timber we have left than to wait until it is all gone and then endeavor to grow more?

Our national and state governments have permitted the destruction of our valuable forests to go on, notwithstanding the knowledge of the experience of older countries and older states, and the necessity for their preservation for the protection of our agricultural interests, the foundation of every nation's prosperity.

Prof. Cleveland, in his work on Forest Planting, quotes the following from Marsh's "Morn and Nature;" "Sir John Herschel enumerates among the influences unfavorable to rain, absence of vegetation, especially of trees, saying: 'This is no doubt one of the reasons for the extreme aridity of Spain. The hatred of a Spaniard toward a tree is proverbial. Many districts of France

have been materially injured by denudation; and on the other hand, rain has become more frequent in Egypt since the more vigorous cultivation of the palm trees.'"

Barth says on the same subject: "The ground in the forest, as well as the atmospheric stratum over it, continues humid after the woodless districts have lost their moisture; and the air charged with the humidity drawn from them is usually carried away by the winds before it has deposited itself in a condensed form on the earth. Trees constantly transpire through their leaves a great quantity of moisture, which is partly absorbed again by the same organs, while the greater part of their supply is pumped up through their widely ramifying roots from considerable depths in the ground. Thus a constant evaporation is produced which keeps the forest atmosphere moist even in long drouths, when all other sources of humidity in the forest itself are dried up."

Another author says: "The rainless territories in Peru and North Africa establish this conclusion, and numerous other examples show that woods exert an influence in producing rain, and that rain fails where they are wanting—for many countries have by the destruction of the forests been deprived of rain, moisture, springs and watercourses, which are necessary for vegetable growth. In Palestine and many other parts of Asia and Northern Africa, which in ancient times were the granaries of Europe, fertile and populous, similar consequences have been experienced."

Savignat arrives at this conclusion: "Forests on the one hand diminish evaporation; on the other they act on the refrigerating causes. The second scale of the balance predominates over the other, for it is established that in wooded countries it rains oftener, and that, the quantity of rain being equal, they are more humid."

Boussingault, after examining this question with much care, remarks: "In my judgment it is settled that very large clearings must diminish the annual fall of rain in a country."

Some writers dispute the assertion that the total annual quantity of rain is increased or diminished by the destruction of the woods, but a very large majority strongly affirm that the rainfall is greater in wooded than in open countries. None dispute the fact that forests act as a reservoir and cause an even distribution of the water, thereby preventing floods and droughts.

The following passage occurs in a report to the legislature of Massachusetts in 1846:

"The importance of forests as furnishing material for shipbuilding and numerous other arts is so obvious that it must occur to

every one; and yet there is danger that in many places, from false motives of immediate economy, no provision be made for the wants of future generations."

Notwithstanding this warning, made public through the legislature of one of the states, the general government continued permitting speculators to get possession of its valuable timber lands at nominal prices, knowing full well that they were taken for the sole purpose of denuding them of their forest growth. It is fifty-five years since that warning was sounded, and it is within that period that the states of Indiana, Ohio, Michigan, Wisconsin and Minnesota have been robbed of the timber which should have been held by the government for the use of the people. We of course realize that there could not have been that material development of the country we have witnessed within the past half century were it not for the timber which has been worked into so many forms for our use and comfort, but had there been greater care exercised in cutting and the young growth protected the manufacturers of Ohio and Indiana would not now be importing hardwood lumber, and the states of Michigan and Wisconsin would not have so many idle mills and deserted towns.

We have examples in this, and in European countries, of forest protection and economical disposition of timber by governments and individuals. There are farms in many states having "woodlots" which for a hundred years or more have been a constant source of supply to their owners, and yet there is no apparent diminution in the quantity of standing timber. There is no doubt that timber can be profitably cultivated on lands unsuited for agricultural purposes, but this requires years of care.

Never in the history of the world was there such a demand for lumber of all kinds as now, and this demand is constantly increasing, while the supply is steadily decreasing. The largest demand for any one purpose is that for the manufacture of wood boxes or packing cases, which is almost double that for buildings. It is plain to see the inevitable end if something is not done to protect the forests we have left and to reforest the denuded lands.

The state of New York sold its lands in the Adirondacks at prices ranging from eight to fifteen cents per acre, and is now repurchasing it, after the valuable timber has been removed, at one to one and a half dollars per acre, for a forest reserve. Pennsylvania also has awakened to the necessity of preserving the forests, and has created a "Forest Commission," which has already purchased several thousands of acres for the same purpose. Our own

state is, in a small way, trying to save our timber from destruction by fire, but our legislators and representatives in Congress do not seem to realize the greater danger which threatens us through the present method of cutting it, or to understand the magnitude of the question. But, thank God, we have a president who does, and through his influence we may succeed in securing legislation that will stop the destruction of our valuable heritage. In his message he treats of this subject so forcibly and concisely that this address cannot close more fittingly than with the following quotation, which furnishes another proof of our chief executive's common sense and justice:

"Public opinion throughout the United States has moved steadily toward a just appreciation of the value of forests, whether planted or of natural growth. The great part played by them in the creation and maintenance of the national wealth is now more fully realized than ever before."

"Wise forest protection does not mean the withdrawal of forest resources, whether of wood, water or grass, from contributing their full share to the welfare of the people, but, on the contrary, gives the assurance of larger and more certain supplies. The fundamental idea of forestry is the perpetuation of forests by use. Forest protection is not an end of itself; it is a means to increase and sustain the resources of our country and the industries which depend upon them. The preservation of our forests is an imperative business necessity. We have come to see clearly that whatever destroys our forests, except to make way for agriculture, threatens our well-being."

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"The forest reserves should be set apart forever for the use and benefit of our people as a whole, and not sacrificed to the short-sighted greed of a few."

Don't Cultivate Too Deep.—Experiments at several experiment stations have shown that too deep cultivation is injurious to corn. The first cultivation should be rather deep, but during subsequent workings the ground should be stirred as little as possible. Simply pulverize the crust and kill the weeds. The roots of the corn extend laterally but a few inches beneath the surface, and when the cultivator shovels expose or tear through them, injury is done the plant. The object of cultivation should always be kept in view: To establish and maintain a dust or soil mulch and to kill the weeds that would rob the corn plants of food and moisture.

ANNUAL MEETING, 1901, IOWA STATE HORTICULTURAL SOCIETY.

A. W. LATHAM, DELEGATE.

The writer had the pleasure of attending the annual meeting of the Iowa society, in the capacity of a representative of this association, the regularly appointed delegate being unable to go. It was a pleasure especially appreciated on account of the fact that this is the first meeting of a state society, other than our own, at which he has been present. Going down Tuesday, Dec. 10th, I was in attendance at the meetings of the 11th and 12th inst. The 13th inst. is included in the program, but was occupied by the business meeting of the board of directors.

The program on Tuesday contained one paper on the subject of apples which I was sorry to have missed, as it was really the only paper having reference to apple culture in the program, and this was a source of regret to me, as I was in hopes to get much information in regard to Iowa orcharding.

A part of Tuesday was taken up, I understand, in considering the organization of a "Park and Forestry Association," which organization was perfected Wednesday morning. The special work of that association is largely included in the work which our own society is itself doing; forestry as we understand it in Minnesota being the care and renovation of forests instead of planting new forests, which would especially interest our neighbor state.

Headquarters for those in attendance at the meeting was at the Kirkwood Hotel, in the heart of the business district, and one mile from the State Capitol, in which the meetings of the society were held. The society has very elegant quarters in the Capitol building. For an office, the room is large, being, I should estimate, some twenty-five feet wide by forty feet long, and proportionately high, although the proportions are so good that the office does not seem very large. The room is richly ornamented and provided with handsome cabinets around the walls containing a fine society library, wax models of fruit and vegetables, some cases of insects, etc. Besides the wall cabinets, there are a number of table cabinets containing wax models of apples also. The room when used as an office must be very pleasant and companionable, and one of which the society may well be proud.

A very creditable show of late keeping apples was spread in the corridors of the basement, perhaps 300 plates, although this is simply an estimate. I noticed very few of our favorite apple, the Wealthy, there, but a good show of Jonathans and a number

of varieties of northwestern origin. There was no special exhibit of seedlings that I noticed, though much attention is being paid to seedlings, I judge, as the society is doing considerable systematic work in connection with its trial stations in the way of making crosses in the fruit blossom, and is working on a regular plan of operation in connection with this hybridizing. It is yet too early, I judge from a report made by Mr. Patten on this subject, to foreshadow results, but this is evidently a rich field in which to experiment.

The State Agricultural College was very largely represented in the program. The State Entomologist, Prof. H. E. Summers; professor of horticulture, Homer C. Price; and his assistants E. E. Little and A. T. Erwin; Prof. L. H. Pammel, the botanist; president of the college, W. M. Beardshear; the chemist, Prof. J. B. Weems; and five ladies from the college as follows: Miss Charlotte M. King, Miss Mary A. Sabin, Miss A. Estella Paddock, Miss M. Ethelda Morrison and Miss Addie L. Knight, whose official relations to the school I did not know and could not find on the program, with the exception noted later. The assistance of these trained minds, as you would infer, added very much to the strength and interest of the program. About fifty were in attendance at the meeting on Wednesday forenoon. At other sessions the number varied from fifty to eighty-five, which latter figure was approximately the capacity of the room.

M. J. Wragg, the president, makes an excellent presiding officer with his hearty way of speaking, and carries the meeting along very pleasantly. The secretary evidently had a very well-sustained plan for the meeting, and I judge him to be a very satisfactory officer. It is a very good test of this to say that the Executive Board at their annual session advanced his salary from $800 to $1,200 a year. He gave a very interesting talk, accompanied by charts, on the subject of the comparative rain supply and forest tree growth, with the conclusion that Iowa is hardly a natural forest country, as the statistics showed the rainfall to be too light. I heard a similar view expressed by another speaker before the meeting, but in conversation with the members, I doubt if that view generally holds with the society.

I had opportunity to make a few notes as anything especially striking suggested itself to me, though in the cases of a number of the papers the topics were of such a general character that it required more space than I could give to them to try to bring away the pleasant and interesting things that were said. I will give briefly here a few of the memoranda taken:

Prof. Emerson, of Nebraska, spoke of the inadequacy of irrigation to supply sufficient moisture needed during the time of the blowing of their dry, south winds, carrying the inference that a shelter of some kind from the force of these winds was necessary to supplement the water of the irrigating ditch. This is a valuable point for the Minnesota horticulturist to remember also.

Mr. W. A. Burnap presented the subject of organizing local societies, and his conclusion was similar to that at which we have arrived, that local and neighborhood societies organized on a social plan are most likely to succeed, and result in longest life.

Silas Wilson, in a report as a delegate of the Missouri annual meeting, spoke of the great apple display there, and I was pleased to hear him say, as a gist of a long consideration of the subject, that they recommended the cultivation of orchards.

Dr. F. M. Powell, who was the delegate from the Iowa Society to our own state meeting, made a report of his observations here, and said as many pleasant things of the Minnesota Society as we could wish. He spoke especially of the "Women's Auxiliary" meeting, and the interest manifested in our gatherings, as well as the large attendance.

Prof. Little read a paper on tomato culture which was very practical. I noticed that he suggested that the grower should save his own seed from selected specimens in order to improve the variety, as well as increase its earliness. In reply to an inquiry, he said that the best tomato at the station was the "Best of All." Tomatoes in field culture yield from 100 to 500 bushels per acre.

Dr. Powell read a paper on the subject of school gardens similar to the one read at the Minnesota meeting, which will appear later in our monthly. In discussing the paper Prof. Pammel said that "nature study was run into the ground" by lack of training of the teachers, and he strenuously advocated the study of botany in our public schools and taking the scholars into the woods and fields to make them familiar with the common things.

Prof. N. E. Hansen thought that in addition the study should be made practical in the way of teaching the scholars how to bud and graft, and to do other similar common things connected with horticultural work.

Secretary Barnes, of the Kansas Society, advocated the setting apart of five acres for school grounds, to be used in connection with practical educational work.

Miss Sabin, Prof. of Domestic Economy at Ames, gave us a talk on matters connected with analysis of fruits and vegetables, illus-

trated with bottles containing proper proportions of the elements found in a number of different articles of food, which assisted in fixing the thought presented. Without stopping to say why, I simply note that she said that potatoes should be cooked with their jackets on, and that breakfast foods are often undercooked—that is, not cooked until the starch is done.

Charles G. Patten presented his report as delegate to the American Pomological Society. I note he pointedly condemned the new organization created there, called the Hybridizers' Congress, and intended to do a part of the work which in his judgment should be done in connection with the Pomological Society.

Mr. A. F. Parsons read a paper on "Horticulture in the Ideal School," which, as its title indicates, was somewhat in the ideal region. These schools must be in the center of a large enough territory so that they may be divided into departments. The teaching must be done as far as possible in connection with the illustration of actual things and the practical things of every-day life. There should be experiment and model grounds on a suitable scale. Mr. Parsons presented a very complete picture of how the thing should be done, and I found it a pleasing one.

Prof. Price spoke of the educational and experiment work of the Agricultural College, and said that there are no short courses at that school; all the students are four-year students. There are seventy-five in the first year course this year. For ladies there are special classes in floral culture and home decoration.

In experiment work he said that the sand cherry used as a plum stock was not especially encouraging. For a cover crop in the nursery and fruit garden he recommended first oats, which even as a heavy covering was found to be sufficiently decayed to be out of the way of spring cultivation. He made a plea for an appropriation of $25,000 for the experiment station, $5,000 of which should be for horticulture, especially in connection with plant-breeding work to develop good apples and experiments in cold storage. There was so much interesting matter in this report that the writer finds it impossible to cite all of it.

Mr. F. W. Taylor, lately in charge of the horticultural department at the Buffalo Exposition, was before the meeting. He is to have the same department at the St. Louis World's Fair. He spoke of the probability of horticulture occupying a part of the agricultural building to be erected there, containing thirty-six acres and to be the largest building of its kind in the world. Considerable sentiment developed in favor of a separate building for

horticulture, but did not materialize in the shape of a protest at the last.

The secretary in his report recommended a law to regulate the sale of nursery stock, and evidently the Iowa people are going through something the same experience that we have in Minnesota over this problem. We hope they may find a legal way to right some of the objectionable features of the present method of disposing of nursery stock.

P. F. Kinne talked of "Timber and the Windbreak." He placed green ash first as of most value, and recommended planting 4 by 4 feet, 2,700 trees to the acre, mixing in other varieties however, to be thinned out within ten years for fuel. Such a growth would attain a height of thirty-five feet in seventeen years. In the discussion it developed that the catalpa and red cedar are not always found hardy in Iowa, and those experienced in the matter recommended getting seed from the north.

Silas Wilson, in a paper on "Renewing the Vineyards," recommended planting vines of the Concord group, in holes two feet wide, dug in the bottom of deep furrows, to get the roots well down for winter protection. Mr. Wilson urged re-planting of vineyards killed in 1898 and 1899. A use for grapes of special value, the making of unfermented wine, was referred to, and Mr. G. B. Brackett, the U. S. Pomologist, stated that in its manufacture grape juice should not be heated above 160 degrees, heating to the boiling point killing the quality.

Seasonable notes by J. R. Sage, director of the Iowa Weather Service, contained the important fact that in the late drought less suffering was experienced in the lee of a grove or hill under clean culture and in fields that were under-drained with tile. Time here forbids enlarging on the above vitally important facts.

W. M. Bomberger, in a paper on forestry and orcharding, stated that fruits succeeded better surrounded by a belt of evergreen, evidently laying considerable stress on the fact of their resinous qualities, their nearness also being a source of production to the orchard. He recommended planting of fruit trees and evergreens in alternate rows.

Peach growing in central Iowa is becoming a financial success on the part of the few who are giving it attention. A paper by M. J. Graham suggested cutting young peach trees back to two feet when planted, and planting in the fall and covering with earth; the next fall cutting back, and cutting back each fall after fruiting. Much was said about varieties, but my notes on this point

are quite obscure. The planting of the seed of what are called the "persistent seedlings" was recommended by some, as not requiring grafting to secure good fruits. Dean's Orange was given as the name of one of these persistent varieties that was successful.

Mr. M. K. Fluke, of Davenport, spoke of the pecan nut tree found growing wild along the Mississippi river to some distance north of Davenport. Trees grown from seed taken there were growing thriftily in northern Iowa. He recommended them for shade trees, as well as for fruit.

Your delegate was most hospitably entertained, being made an honorary member immediately upon entering the meeting, and receiving the kindest of courtesies. "How we do it in Minnesota?" was one of the questions asked him, and was answered with due modesty.

The interest of the meeting was very much increased by the presence of Prof. R. A. Emerson, professor of horticulture at Lincoln, Neb., Prof. N. E. Hansen, whom we all know as the horticulturist at the South Dakota Agricultural College, Secretary W. H. Barnes of the Kansas Horticultural Society, G. B. Brackett, U. S. Pomologist, who spent a day at the meeting, and D. C. Converse, of Ft. Atkinson, Wis., representing the Wisconsin State Society, whose acquaintance it was my sincere pleasure to renew.

The Iowa society is a very successful institution, and is steadily developing along a certain line in methods of its own which are giving valuable results, and from which very much may be looked for in the future. We extend to them our heartiest greetings in their laudable efforts.

Failure of the Stringfellow Method.—The experiment of H. M. Stringfellow, of Texas, of cutting off the roots and setting the stub in a hole driven by a bar, has proved a failure. Most of the trees have died from one cause or another, and less than 300 are left from 1,000 set in February, 1900. Owing to lack of side roots there was nothing to anchor the trees and the wind soon loosened them. The ground, not being plowed or put in good tillage condition, soon dried out, and with the extreme dry weather following the trees soon began to die. Hereafter Mr. Stringfellow will leave more top root and some side roots in setting, but will still continue a closer system of pruning than most practical horticulturists believe wise.—Orange Judd Farmer.

SEEDLING PLUMS.

PROF. E. S. GOFF, MADISON, WIS.

(Wisconsin Horticulturist.)

What is a seedling plum? That all my readers may understand what we mean by "seedling plum," I explain that a seedling plum tree is one that grew from a plum pit instead of from a graft or a bud, as the nursery plum trees are commonly grown. The important difference between a seedling plum tree and a plum tree grown from a graft or a bud is that the seedling tree will not often be of the same variety as its parent, while the tree grown from the graft or bud will be, with rare exceptions, practically of the same variety as the one from which the graft or bud was taken. Since the seedling is generally different from its parent, it has a chance of being better than its parent, and this is why it is important to grow seedlings. By saving the very best of our seedling native plum trees and growing seedlings again from these, we will certainly be able to improve this fruit. Our chances of being able to improve our native plums are greater than they would be of improving the European or the Japanese plums, because our native plums have but recently been introduced to culture; hence, their improvement may be said to have only just commenced.

From what varieties should we select our seed? This is an important part of our subject. Our native plums—especially of the American class—need improving in tree as much as in fruit, and we can no longer afford to work toward better fruit only. The desirable qualities of our native plums will occur to all who are much acquainted with them. I would rate these in nearly the order named, beginning with uniform productiveness, following with size and quality of fruit, vigor and strength of tree, health of foliage, color and keeping quality of fruit, thinness of skin, size of stone, etc. The variety, be it named or not, that possesses the largest number of desirable points and the fewest undesirable ones, is the best one from which to save seed. We can hardly exercise too much care in choosing our parent variety.

The most promising field for improving the native plum is doubtless through hybridization of different species. The Americana and Chicasaw species cross freely and so do the Americana and the Triflora, or Japanese, species. An excellent way to secure hybrids in large numbers, with very little trouble, would be to plant groups of the two species it is desired to cross at a distance from all other plums and then to save and plant all of the pits from these groups. If the trees of the two species are in bloom at the same time, the pits will produce a large proportion of hybrid trees. Our

native plums are infertile to their own pollen, and if we plant only two varieties in each group, the plums that grow on the native trees, at least, will be hybridized.

How shall we grow seedlings? After making several trials, we have had best success by packing the pits from the ripe fruit in a box or barrel with plenty of moist sand, placing the receptacle in a cool cellar until winter and then setting it out doors in a place that is sheltered from the sun, leaving it there until spring. Very early in the spring sow the seeds thickly, about one-half inch deep, in well prepared loam, in rows three and one-half feet apart, and cover the planted rows with fence boards to prevent washing and keep gophers away. As soon as the seed leaves begin to appear above ground remove the boards. No further attention is needed until autumn except to keep the ground well cultivated and free from weeds. It is well to take up the plants late in autumn and bury them in the ground in a well-drained place. This insures protection from mice, rabbits and from heaving of the ground. Whether they are taken up in the fall or not, they should be transplanted the next spring, either to their permanent place or in other nursery rows, where they are given more room.

We have had seedling plum trees bear well the third season from the pit, but as a rule they will not bear much until the fourth year, and some will not bear until the fifth year.

Does it pay to grow seedling plums? From our experience the fruit from seedlings from the best named varieties will average better in size, quality and quantity than that from named varieties taken as they run. The seedling trees are also less expensive, while the chances of securing an improved variety give an added interest to the work. Judging from our experience, an orchard of seedling plums, grown from the choicest varieties only and given the best care, will prove a profitable investment from the market value of the fruit produced. Of course, an orchard of the choicest named varieties, planted after testing them on the ground, would prove much more profitable than the seedling orchard.

In conclusion, I would remind you that the progress we may hope to make in improving the native plum will depend chiefly upon the number that are engaged in the work. This work should not all be left to the experiment stations. It is doubtless true that the largest number of improved varieties of fruit have come from the efforts of amateurs. We have but one experiment station, but we have thousands of farms that can and should grow plums. I am glad that some premiums have been offered in our society and at our state fair for the best seedling plums, and I hope these may aid in awakening an interest in this important subject.

WHAT IS THE BEST APPLE FOR MINNESOTA?

R. H. S. DARTT, OWATONNA.

Editor of Horticulturist:

It is very essential that the people of our state should have a correct answer to this question. A great many have decided erroneously, I think, that the Wealthy apple is the best. That is because they do not know about the Peter. I have Mr. Gideon's catalogue of 1887, and the following is a copy of what he says about the Peter apple:

"We take pleasure in calling the attention of all lovers of fine fruit to what we consider the best apple ever grown. Origin, Wealthy seed, and in form, size and color an exact duplicate of the parent, but differing in flavor and season, keeping from four to six weeks longer. It is what after testing Col. John H. Stevens pronounced the best apple ever introduced since Adam and Eve left the Garden of Eden. The fruit adheres well to the tree, and in tree is a little hardier than Duchess or Wealthy; yet we would not recommend it as far north as some of our extra hardies, though it stood top-grafted 1884-5 where it made four feet of growth and bore apples the following season near by the Wealthy and some of the most hardy Russians that failed to bear an apple, though of longer standing and having borne fruit in previous years. At the Iowa State Fair in 1886 the Peter apple was pronounced by the judges to be superior to the Wealthy in every respect."

Mr. Gideon sold the Peter and several other new seedlings to Bardwell and Haviland, of Fort Dodge, Iowa. These gentlemen kindly donated a liberal supply of scions for trial on the Owatonna Tree Station. It has received a very thorough and extended trial and is certainly of great prospective value.

On account of the similarity between the Wealthy and the Peter, it is likely that the two varieties have become badly mixed. The trouble of distinguishing between the two is perhaps the reason why our society classes both varieties as Wealthy. It is certainly too bad that the best apple in the state should not appear on our fruit list.

REPORT OF COMMITTEE ON OBITUARIES.

LYCURGUS R. MOYER, CHAIRMAN.

Since last we met death has come very near to us, and has taken from our midst some of our best and most loved members.

While our last meeting was in session came the announcement of the death of the eminent landscape architect, H. W. S. Cleveland, a life member of this society. He has left an endearing memorial of his work in the Minneapolis public parks, and in planning the grounds of the School of Agriculture.

Soon afterward another life member, William Mackintosh, passed away, full of years and honors.

Then we were obliged to chronicle the death of another faithful member in the loss of Mr. R. H. Buttermore, of Lake City.

On March 24, 1901, the grim messenger came to one whom we had learned to look upon as the father of this society, John S. Harris, and bade him cease from his labors and enter into his reward. This society has already placed on record a formal recognition of his eminent services to horticulture, and of the loss that we all personally feel.

On May 21st, 1901, that eminent scientist, Prof. Otto Lugger, the friend of the horticulturist, was called to lay down the work he loved so well—all unfinished as it was. This society adopted formal resolutions expressing its appreciation of his invaluable services at its summer meeting.

In August this society was called upon to mourn the death of Captain Judson N. Cross, of Minneapolis, a busy lawyer who yet found time to interest himself in tree planting, in city parks, in forestry and in horticulture. As president of the Forestry Association and as member of the State Forestry Board, he labored long and earnestly to induce the people of Minnesota to make some effort to preserve some remnant of the great northern forests before it should become forever too late. Such men can be illy spared, and his loss will be long felt.

In October came the announcement of the death of L. H. Wilcox, of Hastings, formerly a member of the executive board of this society, and an enthusiast in the culture of small fruits.

These and doubtless others, whose names have not come to your committee, have passed on, leaving their work unfinished. It is for us who remain to take it up, to continue it, until Minnesota shall become a great fruit state, until her forests are preserved and protected, until every town and hamlet shall have its public park and garden, and until every home is surrounded by trees and flowers.

Secretary's Corner.

STRAWBERRIES IN MINNESOTA IN NOVEMBER.—A correspondent tells of strawberries an inch in diameter picked from a bed in Glenwood, Minn., on the 6th of November. Who can make a better record than that?

CHANGE IN THE IOWA DELEGATE.—In the inability of the regularly appointed delegate to attend, the secretary went as a substitute to the Iowa state meeting. A brief report is to be found in this issue. The Iowa people are most hospitable and gave him a cordial welcome to the finish.

WHAT THE CONSTANCE HORT. CLUB ARE DOING.—"The school house ground has been graded and seeded to lawn this summer. Next spring we intend to plant shade trees, evergreens, shrubs and flowers around the school house, and perhaps it will be an object lesson in horticulture and improvement of the home yard for this neighborhood."

ANNUAL MEETING SOUTH DAKOTA STATE HORTICULTURAL SOCIETY—Meets in the Auditorium at Sioux Falls, S. D., Jan. 21-23. Lycurgus R. Moyer, of Montevideo, is our accredited representative, but it is hoped that other members of our society, especially of those living near the state line may be able to attend.

CRAB SEEDLINGS FOR DISTRIBUTION.—"The Horticultural Division of the Experiment Station offers 12 Pyrus baccata seedlings, one year old, to all members of this society who will send ten cents. This is done so that this stock shall have a wide trial in this state. All remittances should be made to Prof. S. B. Green, St. Anthony Park, Minn." These are of special value for budding or grafting, preferably at the crown.

ANNUAL MEETING, WIS. STATE HORT. SOCIETY.—The regular winter meeting of this society will be held at Madison, Wis., February 4-7. Mr. Wyman Elliot has been selected as representative of our society on that occasion. In thirty-four years' connection with the Minnesota society Mr. Elliot has never attended a meeting of another similar state society in this capacity. He should enjoy this one and give us a good report.

DO YOU WANT PAPERS OR REPORTS?—There is quite a collection of agricultural and horticultural papers and a few reports of other societies, mostly with paper covers, in this office for distribution to the members. A package of these will be sent by express to members who apply for them, in the order in which the application is received. If you make an application and do not receive an early response, you may expect something later at some indefinite time.

WILL YOU SEND A NEW MEMBER IN 1902?—The annual membership at January 1st stands at 397 as against 370 at the same date a year ago. Would you like to aid the society, benefit your neighbor and increase your library by sending in some new members? Please read carefully what the society folder says in regard to premiums for new members and send for as many of the folders as you can use to advantage in your neighborhood. They will be sent you by mail.

MINNESOTA STATE AGRICULTURAL SOCIETY.—This society is to hold its annual meeting in St. Paul, Jan. 14-16. A program has been prepared. We note that horticulture is to be represented in it by Prof. E. S. Goff, the horticulturist at the Wisconsin State Experiment Station.

Pres. Cooper will deliver his annual address the last day of the meeting, to be followed by the election of officers.

OLD MEMBERS WHO HAVE NOT RENEWED their subscription by paying the annual membership fee for 1902 and are receiving this magazine are requested to communicate promptly with the secretary, as the number of magazines we are allowed to publish is too small to permit their sending out except to those who are intending to renew their membership. But neither *you* nor the *society* can afford to have you drop out!

DELEGATES TO OTHER STATE MEETINGS.—At a recent meeting of the executive board the following delegates were appointed:

J. M. Underwood, Iowa State Hort. Socieiy, meeting at Des Moines, Ia., December 10-13.

Jonathan Freeman, Northeast Iowa Hort. Society, meeting at Rockford, December 17-20.

L. R. Moyer, S. D. State Hort. Society. Date and place unknown.

Wyman Elliot, Wisconsin State Hort. Society, Madison, February 4-7.

LIST OF THOSE SENDING NEW MEMBERS IN DECEMBER:—

Geo. W. Strand	1	D. M. Mitchell	4
A. B. Lyman	4	P. McCulley	2
Mrs. H. K. Eves	2	W. L. Parker	1
O. W. Sawyer	1	J. T. Jerabek	1
Henry Gerdsen	1	Mrs. Geo. Smith	1
W. W. Pendergast	8	T. E. Cashman	6
A. Terry	1	J. A. Brown	1
H. L. F. Witte	1	Wm. Engelrup	2
Ditus Day	1	M. Anderson	1
A. K. Bush, Farmers' Institute	14	Emil Bruess	1
S. R. Allen	1	Wyman Elliot	1

PROGRAM of the ninth annual meeting of the Southern Minnesota Horticultural Society, to be held in the Armory, Spring Valley, Wednesday, Thursday and Friday, January 15, 16, 17, 1902.

Wednesday, 1:30 p. m.—A Comparison of Past and Future Interests of Horticulture in Southern Minnesota, L. W. Allen, Spring Valley; Some of the Benefits from our Horticultural Societies, State and Local, Mrs. Jonathan Freeman, Austin; Membership in our Society and How to Obtain it, Mr. Guilford, Dubuque, Ia Reports of delegates.

Wednesday Evening Session, 7:30 p. m.—Address of Welcome, Mayor Spring Valley; Response, Jonathan Freeman, Austin; Road to Failure with the Potato Crop of 1901, E. F. Peck, Riverview Farm, Austin; Lessons from the Drouth of 1901, F. W. Kimball, Austin; The Garden of Eden, R. Parkhill, Chatfield; The Surroundings of a Country Home, Mrs. C. L. Hill, Albert Lea; Select Reading, Jonathan Freeman, Austin; Paper, A. E Brent, Cresco, Ia.

Opening Session, Thursday, 9:30 a. m.—President's Address, J. C. Hawkins, Austin; Plums, Jens Jensen, Rose Creek; Bees and Horticulture—Their

Relations Mutual, F. A Ticknor, Austin; Cherries, J. C. Hawkins, Austin; General Farming, Nursery and Fruit Growing as a Combination, Clarence Wedge, Albert Lea; Strawberries and "My Island," M. Hansen, Albert Lea; Paper, G. A. B. Howells, Spring Valley.

Thursday Afternoon Session. 1:30 p. m.—Plants, Shrubs and Flowers for the Park or Lawn, Mr. Guilford, Dubuque; Seedlings, Clint L. Luce, Albert Lea; To Guard against Root-Killing in the Apple Orchard, O. W. Moore, Spring Valley; Flax, with Specimens, Mrs. O. N. Olberg, Albert Lea. Every lady attending this session will be given six choice bulbs of Gladiolus.

Thursday Evening Session 7:30 p. m.—Program for this session will be under the auspices of the entertainment committee at Spring Valley.

Friday Morning Session, 9:00 a. m.—Illustrated Talk on Grapes, R. C. Livingston, Spring Valley; Carnations, P. Clausen, Albert Lea; Melons as a Field Crop, L. P. Lord, Owatonna.

DEATH OF HENRY M. LYMAN.—This occurred at his home two miles south of Excelsior at an early hour Saturday morning, January 4th. The funeral takes place Monday P. M. Mr. Lyman had been ailing some weeks, not being able to attend the late annual meeting, but no special danger was apprehended till near the last. His loss will be sincerely mourned.

At the time of his death he was conducting a trial station at his home. He had achieved marked success as a grower of valuable seedling apples, Lyman's Prolific Crab being only one of many probably valuable varieties of his origination.

THE DEATH OF J. T. FURBER, OF MADELIA, MINN., is announced. The deceased had been a member of this society continuously for the past ten years. The writer had no personal acquaintance with him and does not now recall his attendance at any of our meetings, but he was fruitful in influence for the good of the work of the society which has left its mark, and as opportunity offered he served us. This society is fortunate in having many such helpful friends, who are making records of such honorable service.

Mr. Furber passed away at the ripe age of eighty-one years.

B. S. HOXIE, OF EVANSVILLE, WIS.—Died Dec. 5, 1901. For six years he was secretary of the Wisconsin State Horticultural Society, immediately preceding Ex-Secretary A. J. Philips. He had been president of the Wisconsin Forestry Association since its organization. He was a man of force and zeal and did much work of a practical sort for the advancement of the art he loved.

DEATH OF THOS. MEEHAN.—The death of this eminent botanist and horticulturist is announced as occurring at his home in Germantown, Philadelphia, Nov. 19, last. His had been an exceedingly useful life, a large portion of which he gave freely to the good of his fellow man. He will be especially remembered at home on account of his connection with the development of the local park system.

DEATH OF GEORGE LABBITT.—The death of George Labbitt occurred on December 11th at his home in Lake City, Minnesota. Until recently and for a good many years Mr. Labbitt was a member of the Horticultural Society, but of late his name has not appeared upon the roll, as I understand, on account of his health. He was always interested in the work of the society.

GIRLS' DORMITORY, MINNESOTA SCHOOL OF AGRICULTURE. AMPELOPSIS ENGELMANNI GROWING UP ITS WALLS.

(See opposite page.)

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Trial Stations.

ANNUAL REPORTS,
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CENTRAL TRIAL STATION, ST. ANTHONY PARK.

PROF. SAMUEL B. GREEN, SUPT.

The frontispiece accompanying this is a view of the girl's dormitory at the Minnesota School of Agriculture and shows the growth of Ampelopsis Engelmanni. This is a form of the common Virginia creeper of our woods which clings to brick work or other rough surfaces. For such places it is a great improvement over the common form, as it requires no especial care in training. It is not quite so pretty as the Japanese ivy, but it is perfectly hardy and on this account should be better known in this state. The small hedge surrounding the lawn in the foreground is made of red cedar.

The past season has been one marked by no unusual changes in the work of the horticultural division of the university farm. The orchards, small fruit plants and the plants on the campus came through last winter in good shape and have made satisfactory growth, although some crops were somewhat injured by the severe drouth of midsummer.

A veterinary building, a building for the curing of meats and the addition to the girl's dormitory are among the improvements here this year. This has changed the plan of the campus somewhat and will necessitate the laying out of new roads and a considerable amount of grading and planting.

The publications of this division consisted of a class bulletin discussing the economical features of the proposed park near Leech Lake. Work has progressed satisfactorily upon the revision of "Forestry in Minnesota," which was provided for by appropriation over a year ago, and it will go to press in January. A bulletin is now in press the subject of which is "Horticulture and Prairie For-

estry at Coteau Farm." This embraces the results of our experiments in that section along these lines for seven years. There is also in press a bulletin entitled "Outlines of Laboratory Work for Greenhouse Students." This is in an entirely new field, and its purpose is to show what can be done by students in the greenhouse in the winter in learning the practices which underlie horticulture.

There have been received by the division the following material:

From Royal Palm Nursery, collection of citrus fruits and other tropical economic plants for greenhouse culture.

J. M. Thorburn & Co., Japanese larch seed.

Department of Agriculture: Scions of fourteen varieties of Swedish apples. Scotch pine seed from France. Scotch pine seed from Riga, Russia. Norway spruce from Russia. Pyrus baccata seed from Russia. Japanese larch seed. Seed of Gymnocladus from China. Cryptomeria Japonica.

From N. K. Fluke, Davenport, Iowa: Collection of scions of twenty-two kinds of his most promising seedling crabs. Collection of four kinds of plum scions. Collection of blackberry hybrids.

McNary & Gaines, Xenia, Ohio: One Opalescent apple tree.

Henry A. Dreer, Philadelphia: Collection of cannas, thirteen varieties.

Henry G. Dunsmore, Olivia, Minn: Scions of double flowering apple.

A. E. Hart, Vermont, Ill.: Twelve apple seedlings.

W. Niemetz, Luga, Russia: Scions of seven varieties of hardiest Russian apples. Cucumber seed.

Iowa Agricultural College, Ames, Ia.: Ames plum.

J. B. Rogers, Newark, N. J.: One Newburg Muscat grape.

Frank Yahnke, Winona, Minn.: Two trees Homer No. 1 apples. Two trees Homer No. 2 apples.

F. J. Empenger, Bederwood, Minn.: Minnetonka Iron Clad Giant seedling raspberry.

A. Clark Tuttle, Baraboo, Wis.: Three Repka Malenka apple. Three Tuttle's Winter.

R. H. L. Jewett, Faribault, Minn:: Strawberry, C. F. J., and twelve other kinds.

L. H. Olds, Clinton, Wis.: Potatoes; Dakota Six Weeks, Bovee, Early Michigan.

Miss Emma V. White, Minneapolis, Minn.: Kochia scoparis.

A. O. Haymaker, Earlville, O.: Haymaker raspberry.

Massachusetts Agricultural College, Amherst, Mass.: Dwarf Chinese banana.

Prof. N. E. Hansen, Brookings, S. D.: Watermelon seed of "Our Earliest Russian."

Andorra Nurseries, Philadelphia, Pa.: Ilex crenata.

Experiment Farm, Indianhead, Assa.: Dr. Reider raspberry.

J. A. Hunt, Northfield, Minn.: One peck potatoes, said to be a cross between the Pearl of Savoy and Thorburn.

C. S. Harrison, York, Neb.: Seven kinds of new peonies, one poppy, two phlox; seed of Pinus ponderosa, abies concolor.

R. S. Peterson & Co., Chicago, Ill.: Specimens of fifteen varieties new, very hardy ornamental plants.

W. E. Fryer, Mantorville, Minn.: Plants of Warfield strawberry.

A. D. Barnes, Waupaca, Wis.: Berlin apple, Rose apple.

From Arnold Arboretum, one barrel crab apples.

Wm. Oxford, Freeburg, Minn.: A very fine plum of the Miner type. Ripens by the middle of June.

E. H. Fay & Son, Portland, N. Y.: Two Chatauqua climbing currants.

In addition to the receipts mentioned some nursery stock and garden seeds of standard kinds have been purchased for general planting.

A portion of the garden which for several years has been used for strawberries and vegetables was this year sown to clover to improve the condition of the soil. We expect to break it up in the autumn of 1902.

The small fruit crop was fairly good, although somewhat shortened by the drouth of early summer. Strawberries were most injured by the unfavorable weather. Plums were a fairly good crop, and our orchard produced as much as could be expected for the off year. The new apple orchard which was planted out two years ago has done much better than we expected and is now in very nice condition. The land between the trees is used for strawberries and nursery crops.

The seedling orchard planted seven years ago this year produced fruit for the first time on about twenty varieties, and of these there were a large number of late keeping apples. These seedlings were grown from the Duchess and Hibernal, hand pollinated with some of the hardiest, long-keeping sorts. This work was done at the home of Andrew Peterson, at Waconia. The seed was started in the greenhouse.

Special attention has been paid the past year to the raising of Pyrus baccata seedlings, and all the seed that could be obtained has been planted, and from it we have raised about 12,000 seedlings, which will be distributed to nurserymen and others for experiment purposes the coming spring.

About 20,000 plum seedlings have been raised. Those with the most promising foliage, about 100 in number, have been selected for fruiting, the rest will be sold for plum stocks.

One hundred and fifty seedlings have been raised from the Compass Cherry, and these show the foliage of the sand cherry and the plum.

Five hundred high bush cranberry seedlings have been raised. These were saved from plants selected from the woods for their large and abundant fruiting qualities. This seed generally lies over for one year in the ground, but the seed that we planted last spring started during the wet weather of the latter part of August and the 1st of September, and while they did not push out of the ground, they made a root growth of perhaps four inches. This is something new in our experience with this plant. I am inclined to think, however, that the seedlings are in good shape for starting next spring. We are waiting with much interest the result from this the second generation of this plant from seed on our grounds, for we think there may be a chance to greatly improve its productiveness by such careful attention as we are giving it. If the seed sown a year ago grows well, next spring we ought to have at least 5,000 seedlings.

About 11,000 buffalo berry seedlings have been raised, several thousand of which will be planted on the grounds with the idea of selecting the best, and the balance will be sold to the nursery trade.

Nineteen hundred Russian olive seedlings have also been raised.

The Beta grape is of much promise, and we are propagating it for distribution, but this year have also raised about 200 seedlings from it.

About 2,000 hand crosses were made between the best of our plums and the sand cherry and Compass Cherry.

Fifty apple and plum trees have been grown in boxes and are in the cellar this winter. These are to be started in the greenhouse in April so that the work of crossing the plums and apples, and of the plum on the sand cherry, can be done by hand under conditions which we can control. In April our students are away, and we then have plenty of room to spare in the greenhouse, and if this experiment should prove an advantage it can be made without especial increase in expense.

Twenty pounds of apple seed have been saved from the hardiest varieties for planting for seedlings next year.

Our potatoes have done only fairly well the past year, and were lessened very much in yield by the drouth; nevertheless the results were valuable and will be reported on later in a bulletin on this subject covering the reports of the behavior of this crop for the last three years. We have about 100 seedling potatoes, some of which are quite promising and have been distributed to our several stations for trial.

Five hundred Russian cherry seedlings have been raised and so have 600 seedlings of the Japanese lilac, which is a very beautiful tree lilac having large snowy panicles, which are in bloom about the 20th of June. It is perfectly hardy here, and the seed which we have sown is of our own raising.

Ginseng—The inquiries in regard to this plant have been quite numerous in the past year. It should be more generally known that the plant grows very slowly and that thus far few if any have made any money in cultivating the plant for its root in a commercial way. But the money which has been made in it has come from the sales of the seed and the one-year-old roots, many of which have been bought by amateurs and others interested in the subject of growing this plant. We began experimenting with this about ten years ago, with roots bought from the indians in Otter Tail county. These plants made a fair growth, but were killed out in the drouth of 1894. Last spring we planted 200 two-year-old roots grown from North Carolina seed, but they have made only a very small growth the past season. We have just bought a small quantity of Japanese ginseng seed. This plant is said to be fully as good as the American and nearly as salable. Later on we hope to be able to report on it.

EUREKA TRIAL STATION.

C. W. SAMPSON, SUPT.

Grapes and all small fruits came through the past winter in fine shape. Grape vines have pretty much recovered from the root-killing of two years ago and bid fair to yield a large crop the coming year. Campbell's Early fruited this season and is all that has been claimed for it. In growth and foliage it is as vigorous and healthy as the Concord, ripening earlier, with Moore's Early. Its bunch is large and shouldered; berries large and black with a beautiful bloom; flavor rich, without foxiness; flesh a little meaty, sweet to the center, with small seed, parting freely from the pulp; skin thin but tenacious; hangs to the vine without dropping its berries and remaining in sound condition until severe frosts strip its foliage. It is really an improved Concord.

The McPike grape is also another very promising new variety, but has not fruited with me yet. I hope to report on the fruit another year. The vine is very vigorous with healthy foliage and a strong grower.

The Dracut Amber is a very promising variety for general cultivation in the garden. Vine very vigorous, healthy and hardy;

bunch large and long, compact, often shouldered; berries large, round; skin thick, of pale red color; a little foxey with nice flavor. I would recommend it for family use only.

Lady—One of the best early white grapes. It is free from mildew, requires a good fertile soil to bear well, but will over-bear if not trimmed. By reason of its early ripening it is specially adapted to northern localities where the Concord does not always mature. It ripens with the Delaware. In color is light greenish yellow, covered with white bloom. Seed few and small; skin thin; pulp tender; flavor very sweet. Although extra early in ripening, it is late in starting its buds in spring, and thereby escapes the evil effects of late spring frosts.

Apples were a very late crop indeed. Plums bore a heavy crop and brought from $1.00 to $2.00 per bushel. Strawberries were a good average crop of fine berries. Red raspberries about two-thirds of a crop, but brought a very nice price, making the returns as much as if there had been a big crop and a low price. Currants and gooseberries were a good fair crop.

LA CRESCENT TRIAL STATION.

FRANK I. HARRIS, SUPT.

This station, as you all know (and no one realizes this fact more forcibly than the writer), received an irreparable loss in the decease of the former superintendent, my father, the late J. S. Harris, so well and favorably known to you all.

Fully expecting that the station would be abandoned I made no preparation for continuing the experiments under way until after the summer meeting, when I received official notice from your secretary that I had been elected his successor.

For this reason because of the multitude of other duties devolving upon me, and all demanding a share of my limited time, this my first annual report is not as full and complete as I should desire, and will doubtless prove disappointing to many of the members as well as to myself.

Could we have known in advance that so soon would my father's life work be completed, how different it might have been! Living under the same roof for twenty-seven years and within a stone's throw for nearly twenty more, partners in business for twenty-five years, my advantages were favorable, and I now realize that they were sadly neglected. But while our interests were largely mutual, my attention had been absorbed in the struggle for an existence, and my interest in the work principally as a means for

keeping the wolf from the door, while his was a labor of love and his desire to benefit mankind.

Another serious drawback is found in the fact that no one thoroughly understands his plans, and much of his work is lost and will have to be done again by others.

Trusting the members will pardon these explanations, I will proceed to report briefly the work accomplished during the past season.

The past winter (1900-1901) being an exceptionally mild one but little if any damage was sustained in the orchard. Small fruit, notably raspberries, were severely injured and this, too, without regard to protection, so that I am convinced the damage was caused by a late fall growth and immature canes.

A few sickly trees died during the drouth and will be replaced with standard varieties the coming spring. It was not a "bearing year," but little fruit was expected and—right here—a serious mistake was made by not continuing the thorough spraying of all bearing trees. The improvement in quality of fruit on trees so treated the previous year was so marked that there can be no question as to results, and at the comparatively high prices of fruit caused by a general scarcity the labor would have been well rewarded, besides helping to exterminate the "bugs" for next year's benefit.

A good many of the trees in the new trial orchard, mentioned in the last report of this station, fruited for the first time, but owing to poor quality the merits of but few varieties could be determined without further trial. Destructive wind and hail storms also shook off more than half the crop, but in spite of these drawbacks some 200 bushels of apples were harvested and sold at remunerative prices.

The plum crop was better than expected; quality fair but size small. Many of the newer varieties fruited, and a number of them have merit, but I neglected to keep the record. The peach trees mentioned in the mid-summer report matured three bushels of superior fruit and that, too, without winter protection. Several pear trees also bore fruit, but the "small boy" harvested most of it before thoroughly ripened.

As the small fruit was reported upon at summer meeting I will only add that the Warfield strawberry sustained its reputation as the most profitable market variety but was injured considerably by drouth. The Loudon raspberry also jumped to the front again, both as a shipper and table berry with me, but with others, including my nearest neighbor, they were voted a failure. I conclude that they are all right except during wet weather and on heavy soil.

Cuthberts were badly injured but bore a half crop. Blackberries promised a good crop but were injured by drouth. Best variety as usual was Ancient Briton.

Grapes yielded a fair crop of good quality, the best varieties being Worden, Moore's Early, Brighton, Niagara and Concord. Campbell's Early came into bearing for the first time, and I am well pleased with it. Delawares were poor. Concord proved best seller in large quantities.

During past few years the orchard has suffered for want of pruning and thinning on account of the poor health of the former superintendent. Considerable work has lately been done in this line, notably in the removal of every alternate tree in the Russian orchard and thinning out the remainder, and an improvement in quality of fruit is expected and will be reported on at the next annual meeting.

MINNESOTA CITY TRIAL STATION.

O. M. LORD, SUPT.

Spring setting of apple trees not before tested here:

From W. S. Widmoyer, 2 M Cross, 1 Beecher's Sweet, 2 Rollin's Prolific, 2 Rollin's Pippen, 2 Windsor Chief, 2 Sops of Wine.

From C. G. Patten.—1 Patten Greening, 1 B. T. Sweet, 1 Briar Sweet No. 2.

From Cowles.—2 Meader's Winter.

From Wilfert.—Scions of Wilfert apple, Emily cherry and Wilfert plum.

Two scions from Bates, of Stein's winter apple seedling.

From State Experiment Station.—1 McPike grape, 25 Rathbone blackberry, 25 Pyrus baccata, 6 Russian olive, 10 Abies concolor.

With two or three exceptions these are growing and doing well.

The bearing apple trees at this station bore little fruit this year. There was, however, a fair crop of Repka Malenka, Walbridge, Northwestern Greening and Longfield; and also Virginia and Shield's crabs. Some young trees, seedlings of the Wealthy, bore very well. The Wealthy, Golden Russett, Fameuse, Hibernal, Duchess, Peerless and others had no fruit worthy of mention.

Plums—There are of bearing age nearly 100 varieties, fifty of which bore well this year, though some kinds were hurt by drouth. Among the new kinds bearing for the first time this year the Ames' Hybrid gives most promise.

Cherries were a good crop, the Wragg yielding the most and best fruit.

Though little attention was given to grapes, the Concord yielded well. Delaware, Moore's Early, Worden, Lindley, etc., had no fruit.

Currants were very fine this year, the old Red Dutch and Victoria giving large yields.

Of gooseberries Pearl was the only kind that bore.

Blackberries. The Briton, Snyder and Badger gave a medium crop, shortened somewhat by the drouth.

Red raspberries. Cuthbert and Turner were root-killed and had to be plowed up; the Loudon was unhurt.

All varieties of black raspberries were killed—a condition that has not occurred at this station before.

The following list of strawberries has been retained as among the best tested here: Crescent, Brandywine, Bissel, Wm. Belt, Mary, Gardner, Splendid, Bederwood and Warfield.

Mr. W. L. Taylor: Was the Nemaha killed?

Mr. Lord: The Nemaha was killed with the others. I believe I had all the varieties in the catalogue on the place except the Older. They were all root-killed; the tops looked all right this spring, but they were all root-killed.

Mr. Wedge: I want to ask about the Ames' Hybrid plum?

Mr. Lord: That was the name given it by Prof. Budd when he sent it.

Mr. Wedge: What is it like?

Mr. Lord: It is a cross between one of the Japan varieties and the Americana. It is a very fine plum. It is a perfect freestone, large in size, and the tree is a fine grower.

Mr. Underwood: Do you know what was the cause of the root-killing of your raspberries?

Mr. Lord: I have not the least idea of the cause, Mr. Underwood.

Mr. Underwood: Was it not due to the drouth?

Mr. Lord: No, I think not.

Mr. Dewain Cook: Was it not on account of the cold weather?

Mr. Lord: I cannot give an opinion because I have none. I simply don't know.

Mr. Underwood: Were they mulched?

Mr. Lord: Some were, and some were not.

Mr. Underwood: Was the ground wet or dry when it froze?

Mr. Lord: I thought they went into winter quarters in good condition. The ground was rather moist. You will remember Mr. Harris reported that his raspberries were killed, and he thought it was owing to the late growth in the fall. I was never more surprised in my life, because it never occurred to me that there was anything wrong with them, and I had no means of knowing why they were killed; but they were all so effectually root-killed that I had to plow them up.

Mr. Underwood: How many did you have?

Mr. Lord: I had four acres of them.

Mr. Underwood: Did they bear the year before?

Mr. Lord: The black raspberries bore a heavy crop.

Mr. Burtzlaff: My experience was that the year before they bore a heavy crop, and I do not believe they had time to mature and go into winter quarters properly. I believe that was the reason they root-killed.

Mr. Vollenweider: How old were your bushes?

Mr. Lord: They were set at different times; the youngest were three years old.

Mr. Yahnke: Did your raspberries start to bloom the fall previous?

Mr. Lord: No.

Mr. Yahnke: I had some red ones that did.

Mr. Lord: I never prune my raspberries till the spring, and the way the bushes looked I supposed I was going to have a big crop.

Mr. Underwood: Was there much thawing and freezing of the ground?

Mr. Lord: Yes, considerable; more than usual.

Mr. Underwood: I believe the evidence bears out what the gentleman said, that the heavy fruiting of the vines weakened the vitality of the vines; then, on account of the excessive rains we had late in the fall, they began growing again. As you will remember, we had an abundance of rain, and it kept everything growing—and they went into winter quarters in a weakened condition. I think perhaps that explains it; also, the alternate thawing and freezing may have had something to do with it. I will say that we never had so much root-killing as we had that winter. The previous winter the thermometer went down to 50 degrees below, and we did not lose a tree, but that winter the trees were ripened; but this past winter, the time this loss occurred, there was an excessive rain and a consequent late growth with alternate freezing and thawing during the winter, and I think we may trace the cause of the root-killing to those conditions.

Mr. Elliot: The conditions with the raspberries were similar to those found in the orchard. The trees in the orchard did not shed their leaves, but they held right on until after it froze up. I want to ask Mr. Lord whether he pruned out the old wood after the fruiting season?

Mr. Lord: Not in the raspberries. I never do that; I prefer to let the old wood and everything remain to help hold the snow. What puzzled me most was that all the failures I had ever had were with the tops only; but I found the canes in good condition in the spring, and I thought I was going to have a big crop, but when I came to examine them they were dead. I must say as Mr. Underwood says, "perhaps" this did it.

MONTEVIDEO TRIAL STATION.

LYCURGUS R. MOYER, SUPT.

Licium halimifolium is hardy and vigorous but spreads badly by creeping rootstalks, so as to become a nuisance. Its red fruit toward autumn is more showy than its rather inconspicuous lilac-colored flowers.

Lepargea argentea (buffalo berry) has made itself at home in our shrub border. It is the earliest shrub to bloom in the spring, opening its rather inconspicuous flowers about April 20th. Its silvery foliage looks best before a background of dark foliaged trees. The pistillate bushes are abundant bearers of bright colored berries. At this writing, Nov. 12, the bushes are still covered with them, dried and cured. The bees frequent the buffalo berry blossoms, and it is likely that they assist in the fertilization of the flowers. Pistillate bushes at a distance of several hundred feet from pollen-bearing bushes produced this year a full crop of fruit.

Elaeagnus argentea (Russian oleaster) continues to make a good record. The older trees are now about twenty feet in height. The flowers have a pervasive perfume; the leaves are larger and more whitened than even the buffalo berry, and the shrub is hardy on the bleakest and most wind-swept prairie. The fruit is insipid and inconspicuous, but remains on the tree nearly all winter.

Morus alba Tartarica (Russian mulberry) has become pretty well established with us now. The older trees are about sixteen feet in height and produce annually immense crops of rather tasteless fruit. The berries are dearly loved by all fruit-eating birds, and as long as the mulberries last the cherries are safe. The birds take the entire crop of mulberries and make no complaint as to the quality of the fruit.

Spiraea Van Houttei stands at the head of spring flowering shrubs with us. The flowers are of a pure dazzling white, and are produced in such profusion as to bend over the branches and give the shrub a "weeping" effect. The half-tone following shows how the shrub succeeds on the prairies of western Minnesota. There are other good spring-flowering spiraeas, such as Spiraea hypericifolia and Spiraea trilobata, but the color of their flowers is rather greenish. Where there is room for but one spiraea it is best to plant spiraea Van Houttei.

Spiraea sorbifolia, a Siberian species, is with us a thrifty large-growing shrub producing fine panicles of white flowers early in summer. The leaves resemble those of the mountain ash. It is a valuable and interesting shrub for prairie planting.

Closely related to the spiraeas is the nine-bark (Opulaster opulifolius), one of the most desirable shrubs at Montevideo. It grows to a height of from six to eight feet. When in bloom in June the shrub is completely covered with its spherical flower clusters, to be followed later on by its equally showy reddish seed pods. The golden-leaved form does not seem to be quite so hardy as the typical species.

Spiraea Van Houttei at Montevideo Trial Station. Russian Mulberry in the background. Buffalo Berry at the right.

The native Spiraea salicifolia, common in wet places, does well with us in the shrub border, and responds to cultivation by producing larger flowers than it does in its wild state.

These reports have universally testified to the great value of the different species of Philadelphus for prairie planting. In one of the early reports from this station the opinion was advanced that the least hardy species on trial was Philadelphus coronarius. This species has since been given good cultivation, all dead branches being removed, with the effect of giving the shrub a new lease of life. With us it is the earliest species to bloom and is much the most fragrant.

There is much confusion in the nomenclature of the garden forms of Philadelphus. It seems likely that the variety sent out by Prof. Budd as 144Vor. is a form of Philadelphus pubescens. It is a very desirable variety. A recent writer on the genus regards the form known as Philadelphus speciosus as a synonym for Philadelphus laxus. Philadelphus grandiflorus is united with Philadelphus inodorous, while Philadelphus speciosissimus becomes a form of Philadelphus zeypheri. This last species is only moderately rampant in growth, but it produces large white flowers in the greatest profusion.

Philadelphus microphyllus was planted by us in a rather shady position, and it has not done very well. We shall remove it to a more sunny location. With us the latest Philadelphus to bloom is Philadelphus Gordonianus.

Swiss Mountain Pine at the Montevideo Trial Station.

The bush honeysuckles continue to give us great satisfaction. They are all very hardy. Lonicera Tartarica in its several forms seems to be at home on the prairies. The bright pink-flowered form received from Prof. Budd as Lonicera splendens is one of the best. It is now known as Lonicera Tartarica speciosa. The form

with small white flowers sent out by him as Lonicera gracilis is now known as Lonicera Tartarica parvifolia. Lonicera Ruprechtiana is another vigorous bush honeysuckle, producing attractive white flowers and red fruit. Lonicera Morrowi is of similar character, equally hardy, but not of so robust a habit. The bush honeysuckles are much used by landscape architects for their showy fruit, but on the prairies where fruit is yet scarce the berries are all taken by the birds as fast as they mature.

Picea Pungens at Montevideo Trial Station. Populus Siberica Pyramidalis at the right.

Lonicera Sullivantii, received at the station as Lonicera flava, does very well as a climbing shrub, reaching a height of six or eight feet. Its pale glaucous leaves and bright red fruit, persisting until late in the season, make it a striking object. It is a native species and very hardy.

Acer ginnala (Manchurian maple) has grown to the height of about sixteen feet. It is now blooming and bearing fruit. The wings of the seeds are finely colored and very beautiful. These

shrubs vary greatly, some having dark green leaves and others light colored variegated leaves.

Seventeen years ago there was planted at the station three specimens of Pinus montana, the Swiss mountain pine. One of the trees has made an upright growth and is now about twelve feet high, resembling in some way a Scotch pine. The other two are dwarf, round headed trees, not more than seven feet in height. No conifer that has been planted at Montevideo stands the winter better, the foliage always being a bright green. For prairie planting it appears to be the hardiest of pines. Its low, dense growth makes it a most attractive object in the shrub border at all seasons of the year.

The Colorado blue spruce (Picea pungens) has been growing at the station for twelve years. It is a thrifty, hardy tree, but not a very rapid grower. The foliage sometimes browns during severe winters.

The Montevideo Trial Station in winter. White Spruce at the left; Swiss Mountain Pine, Red Cedar and European Larch at the right.

The white spruce (Picea Canadensis) has been growing at Montevideo for thirteen years. The group shown in the cut is that species. The group consisted of thirteen trees when set; it is thirteen years old and consists of thirteen trees now. Thirteen is not an unlucky number, and the white spruce is a good tree. Our experience with it would go to prove that there are no safer trees of any kind. None of them failed, and they are all healthy, thrifty trees now.

PLEASANT MOUNDS TRIAL STATION.

J. S. PARKS, SUPT.

The past season has been an off year in the fruit crop here. Apples bore heavily last year; this year they are resting. Plums and small fruits were about half a crop.

Trees have made a satisfactory growth of well ripened wood. The soil has about the proper amount of moisture to take the trees through the winter in good condition.

During the extremely hot weather in July fire blight affected several varieties of hybrids and caused much dropping of fruit and injured the quantity and quality to a serious extent.

Insects have never before troubled our fruit, but this season several varieties have made their appearance and warn us that heroic treatment will be necessary hereafter.

Encouraged by recent developments we are trying again several of the half-hardy varieties of apples, plums, pears, etc., that in our early planting all died.

The Walbridge, that a few years ago died down nearly every winter, is now doing well and giving us a liberal amount of good keeping, poor quality of fruit.

The Snow is of the best quality we have, and trees appear hardy.

The Wealthy is overbearing and short lived apparently on that account.

A variety we call Canada Red is giving good satisfaction as a long keeper of fine fruit; tree appears hardy and worthy of general introduction.

Of forty or more varieties of long keeping seedlings and unnamed apples that are being tested, some are of great value and will be reported on hereafter.

The Wolf River remains the best all-around apple we have. The tree is hardy and out-lasting the Duchess or any other trees of same age on our grounds, the fruit selling more readily and at higher prices than any other fall variety we have. This season they sold readily at $1.75 per bushel at home, while the best other kinds sold for one dollar.

During a recent trip to New York, Vermont and Canada we found several promising varieties of apples that we propose to introduce and try top-worked here, and believe some will prove a grand acquisition to our already long list of choice, hardy varieties.

SAUK RAPIDS TRIAL STATION.

MRS. JENNIE STAGER, SUPT.

Although we had a very dry spring, our strawberries being heavily mulched bore exceedingly well; raspberries not as well as usual; currants a small crop; and gooseberries a large one, although the fruit was not as large as usual. We had very few plums and few apples. We lost most of the seedling evergreens planted this spring, but with few exceptions all other ornamental and fruit trees came through all right. The season of growth was short, and whether they have matured enough to go through the winter even with a heavy mulch remains to be seen.

VIOLA TRIAL STATION.

WM. SOMERVILLE, SUPT.

I have been experimenting with fruit trees in Minnesota for the last forty years. As fruit growing was an experiment to within the last few years, so I bought almost every variety that came along, and I have more than 100 varieties, more than I wish I had. This year we had a small crop, yet very good for an off year; perhaps five or six hundred bushels. Many of our trees were heavily loaded, and many had few or none. The Hibernal, Longfield and Duchess seedling No. 8 had heavy crops; the Duchess, Wealthy and all the Thompson seedlings, of which I have ten varieties, all bore a reasonable crop. They have come to stay with me. We had a ready sale for all we grew for seventy-five cents to $1 per bushel.

Our small fruits had a fair crop. Plums very good. Raspberries were very good, especially the Schaffer. Our grapes were almost an entire failure. An average crop of cherries of the Morello and Early Richmond.

WINDOM TRIAL STATION.

DEWAIN COOK, SUPT.

The winter of 1900-1 was unusually mild, the coldest being only 16 degrees below zero. Early snows drifted in among our trees and shrubbery, continuing there during the winter; consequently no root-killing to trees occurred.

The following stock was received at this station the past spring and except where noted has done very well:

From Andrew Wilfert.—Some scions of the Wilfert apple.

From the State Farm.—Ten red cedars, twenty-five jack pines and some concolor; also some seedlings of elms, hackberry, eleagnus, caragana and Pyrus baccata; three Senator strawberry plants and a collection of flowering shrubs and greenhouse plants.

The red cedars were alternated in a row with the jack pines. The cedars are now all alive, but the pines all died. The Senator strawberry proved to be a vigorous grower and seems to be a perfect flowering Warfield.

From C. E. Older, of Luverne, Minn., a lot of Brandywine strawberry plants and twenty-five De Soto plum trees on their own roots.

From E. D. Cowles, of Vermillion, South Dakota, ten Oleson plum trees and twenty-five Forest Garden plum trees, all on their own roots.

From Wyman Elliot, ten Royal Wolf plum trees on their own roots.

From H. A. Terry, of Crescent City, Iowa, the following varieties of plum trees: Terry's De Soto, Legal Tender, Pearl, Lottie, Ames, Champion, Admiral Dewey, Admiral Schley and Bomberger.

Our plum crop on the whole was fair, although the late blooming varieties did not amount to much. Owing to midsummer drouth, the fruit was generally undersized. We had some heavy rains, which began on Sept. 8th, and about all plums that were not ripe at that date cracked so badly as to be worthless.

The gouger and curculio were not as numerous as usual, owing we think to the effective work in destroying them the previous season. Our earliest plum was an unnamed freestone of the Weaver type, from Manitoba. It was ripe Aug. 1st. About ten days later the Aitkin was ripe, followed a little later by the Cheney and other early varieties.

The plum rot was, as usual of late years, bad, and the fruit of many seedlings was a total loss. Some varieties appear specially susceptible to the rot. Unfavorable soil and imperfect ciculation of air seems to aggravate the disease. The following varieties have from several years' test proved practically free from the rot under the various conditions I have grown them, namely: Rollingstone, De Soto, Wyant and Cheney; while on the other hand the New Ulm, Iowa, Wood and Mankato have proved extremely susceptible to the rot, and under unfavorable conditions it has destroyed the entire crop of those varieties.

The varieties that have given the best satisfaction the past season were the De Soto, Wyant, Rollingstone, Wolf, Cheney and Stoddard. The Wolf and Stoddard, from young trees, sold for two dollars per bushel. The other varieties sold at from one dollar to

one dollar and fifty cents per bushel. The largest variety we fruited was the Bursota. It is promising. Altogether we had about 150 bushels of plums.

Our strawberry plantations are now in a promising condition for a crop next season. The early part of summer was very hot and dry, but the last half of August, all of September and October was fine growing weather for them. The strawberry worm retarded the growth of the plants early in the season. These worms have bothered us several seasons during the past fifteen years, but only in those seasons when either by mulching or snows the plants were covered early in autumn.

This was an off season for the apple and crab. We fruited about eighty-five varieties, and had about 250 bushels of the fruit. We had a little blight early in July that affected about all varieties that were sheltered by trees on the south and west, but no serious damage was done, and it only lasted a few days.

The foliage of the trees was better than for several years past, and the leafhopper was correspondingly less.

The codling moth has not yet got a foothold in our orchard, but the apple scab was noticeable in many parts of it.

The Yellow Transparent was the earliest to ripen, followed closely by the White Astrachan, Tetofsky, Champagne Pippin, Juice White and others. The Blushed Calville fruited for the first time; the fruit does not ripen early enough to be classed among the extra early varieties and is rather small to compete in the markets with the Duchess. Our main crop consisted of the Wealthy, Duchess and Hibernal, and from the ready sales of the Hibernal for a cooking apple I am more than ever impressed with its value for this section.

Of good sweet apples we have the Champagne Pippin, which is promising as an extra early, good eating apple, and Reipka Reislaye, or Sweet Reipka, which is of the season of the Wealthy or a little earlier. The Sweet Russet is also in demand as a good eating hybrid.

Of other than sweet apples the following have proved to be of excellent quality for eating out of hand: Utters, Gideon, Peerless, Peter, Wealthy, Rollin's Pippin.

Our largest varieties were Patten Greening, McMahon White, Little Hat and Antonovka.

Of the late keepers the Malinda is so far in the lead, and the fruit does not blow off the trees.

The Cross apple is a success, but we have not tried keeping them. Grandmother and Skalanka Bogdanoff, as I have them

from Prof. Budd, are identical and promise to be keepers, but owing to some weakness of the blossoms have so far proved shy bearers.

We have some promising apples that in season appear later than the Wealthy, and I will name a few: McMahon, Gideon, Compton No. 1, Hotchkiss, Grundy, Judson, Thompson and Antonovka. We have others not mentioned, but as yet they have not promised much.

In the crabs the Martha would take the lead as to the quality of the fruit, but it does not bear anything to speak of. The Virginia crab does well, and everybody admires the fruit. It bears a light crop every season. The Florence bears a heavy crop on alternate seasons. The fruit is very desirable, is of medium season and only lacks keeping qualities. Early Strawberry is our earliest crab; it bears heavily only on alternate seasons. Compton's No. 3 fruited on about a dozen trees. The scab was worse on this variety than on any of the others, part of the fruit being entirely worthless from scab.

Of hybrids the Whitney bears each season and sells well. My two trees of the Sweet Russett bear annually, and it is in great demand for eating out of hand. The Minnesota also bears annually, but nobody wants it for a crab; it only sells well when apples are scarce.

One Russian pear tree, 392, set the spring of 1886, bore quite a few specimens. I omitted to mention that the Breskovka has proved to be a valuable early apple, coming about one week earlier than the Duchess, and bears a good crop every season.

As to conifers I have found that it is about useless to plant them on the open prairie here unless some means is provided to protect them somewhat from the severe winds that prevail here during the winter. With this protection most of the desirable evergreens seem to succeed here. The exceptions so far noted are the white pine, which only makes a feeble growth and is not hardy, and the Norway spruce, which is also not as hardy as desirable, although I have some very fine specimens growing. The jack pines I have not been able to get well started. The red cedar transplants the easiest and seems adapted to the wet alkali soil on the highest and driest soils; the Black Hills spruce holds its green color the best of all and is probably the hardiest evergreen I have.

The following conifers are doing very well here: Scotch pine, Austrian pine, white spruce, black spruce, Black Hills spruce, Douglass spruce, concolor, blue spruce, red cedar (Juniper Virginiana), red cedar (Rocky Mountain juniper) and arbor vitae. A

tree of the silver cedar, received from Clarence Wedge, spring of 1900, is doing nicely and is admired by all who view it.

A few general notes on the behavior of trees at this station, and I will close. The apples and crabs do the poorest on the highest lands and best on the more nearly level land. This is owing no doubt to the lack of sufficient moisture and a greater liability to root injury on the higher land. Blighting varieties blight most on the higher lands. A windbreak on the south and west of an orchard is very important in keeping the fruit from blowing off the trees. Plums do best on the higher lands; there is quite a lot of alkali in the soil of my lower land, and even when well drained and heavily manured the plum trees do not do well in that kind of soil.

MEADOW VALE TRIAL STATION.

(PRIVATE STATION.) A. W. KEAYS, SUPT.

The results of our work the past year are very encouraging. Several of the new varieties of apples bore this year for the first time. Those on hardy roots gave the finest specimens, and the trees also made the best growth. Trees on common seedling roots have not done well since the winter of 1900, and although growing slowly I think they will not recover from the shock. We must have a hardier root than the common seedling; rooting from the scion will not do. In this part of Minnesota a few will root, but they are not reliable, and several of the scion roots kill as easily as the seedlings.

Our Charlamoff root grafts of 1896 on hardy roots again bore this year twice as many apples as last, and every apple was perfect. We took first prize at the state fair on them. It has been stated by many fruit growers that scions from bearing trees will fruit earlier than those from trees that have not borne, but the Charlamoff trees from which those scions were cut for root grafts of 1896 have not fruited yet.

Some of those hardy roots were planted in the most exposed part of our grounds in a row with several others supposed to be hardy, but they were all frozen out except those hardy roots, and they are growing finely. Where the seedling roots were protected by mulch they were not injured, but where they were exposed they were killed. By actual tests here about one seedling in one hundred stood the winter of 1900 without mulch protection. This part of our orchard was not protected by snow nearly all winter. One seedling of Patten Greening came out in fine condition.

I examined some of the large peach orchards of Michigan in October last and found they had protected the roots of their trees

with a mound of earth two feet high and five or six feet across, and the trees were in splendid condition and bearing large crops of very fine fruit. Those not protected showed some injury from root-killing. Would it not be a good plan to so protect our seedling roots until we have trees on roots that will need no protection? I visited many of the apple orchards in the east and found many of the old orchards failing. Some have been cut down, and many that are left do not pay for the land they occupy. Very few young trees have been planted in the last twenty-five years. I also noticed that the orchards which were properly cultivated produced fine, large apples and were paying the owners well, but the neglected orchards gave very little good fruit, mostly a lot of inferior, unsalable stuff that was a loss to the grower.

Blight. I noticed several years ago that Transcendent crab on its own roots never showed any blight, but all Transcendents on seedling roots blighted very bad, and I had to grub them out. I never have had a trace of blight on any Transcendent on its own roots, although blight has been very bad all over this section on the Transcendents. I think the blight is caused by uncongenial stock.

We have several thousand seedlings of Pyrus baccata and the hybrids, which we are using for stocks for the large apples. We shall make a thorough test with them in many different ways to determine their adaptability as stock. Our work with them so far is very satisfactory. I am also trying the wild crab as stock, and the results are better than I expected. This crab grows wild here and seems better than those farther south, the fruit being larger.

We have added twenty-five new varieties of apples to our orchard the past year, mostly to try their hardiness and some to produce pollen to cross for new seedlings.

Most of the apple trees ripened their wood early and went into winter with plenty of moisture in the soil.

There is no doubt we will make many mistakes in carrying forward this work, but we are determined to keep everlastingly at it with the expectation of finding something that will be of value to us up in this cold north; we realize that we will have to work this problem out ourselves.

Prof. N. E. Hansen, South Dakota, sent us fifty plants Prunus Besseyi for trial. Prof. S. B. Green sent fifty P. baccata, fifty Acer ginnala, besides apple scions for our experimental work. Quite a large number of new specimens are to be added to our collection this year.

Plums again bore heavily this season; the Cheney, Rockford and Wyant bore an immense load on the young trees. Ocheeda

bore a good crop, and the fruit is of good quality. Surprise did not kill back the past winter and bore this season. Several of the varieties on trial are not bearing satisfactorily and will be grubbed out and replanted after another year's trial. Several new plums will be planted in the spring.

Compass Cherry is a good fruit, bears a large crop and bears every year; can be eaten from the hand, makes a good pie and is valuable for canning and sauce and can be dried like other cherries. It is perfectly hardy. It is of no use on Prunus pumila stock here. I have had the best success with Prunus nigra stock. There may be other stock that would be as good as this. I have them on their own roots, but they have not fruited yet.

I think Ponderosa pine will make one of our best evergreens. It grows very thick in the bottom and makes as good growth as the Scotch pine and is always a beautiful light green. The arbor vitae does well here, fully as well as the red cedar that are native here. Those from Illinois have all died; they seem to be tender here.

We have added a miniature park, using for the purpose a piece of land occupied by the usual farm rubbish piles, showing what can be done with a few trees, shrubs and flowers and a little work.

In traveling through the country I noticed a school yard that was nicely graded down. The people are planting the ground with trees, shrubs and flowers; they have it nicely laid out with a walk and driveway with flowers on one side and trees on the other. They have a playground on the opposite side of the school house, which will be surrounded with a row of ornamental trees. This is quite a curiosity and so different from the usual school yard, which is a very dilapidated looking place, the yard strewn with wood and sticks, fences broken down, no trees for shade or flowers to please the eye. A good reason why children do not like to attend school. I hope to see in the near future the school grounds a miniature park. Nothing would be better than to educate the children in the care of flowers, shrubs and trees. It would be a pleasure to them, and this education would remain with them in after years, and they would grow up to be men and women with a taste for the beautiful in nature.

I want to say a word in regard to our timber land. Where will our supply of timber come from in a few years if our remaining forests are allowed to be destroyed? The time will soon come when we will have to plant forests for our supply of wood. In this immediate vicinity, taking the past twenty-five years, fully one-half of the standing timber has disappeared. The country is fast

settling up, and the timber has to be cut away to make room for other crops. Fires are continually burning up the young growth. Thousands of acres that were formerly covered with thickest of young trees, have been swept away by the fire. The remaining timber lands are mostly being pastured, which soon kills most of the larger trees, especially on the higher land. The tramping of stock packs the soil, and the rains do not enter the ground but run off, and the trees soon die from lack of moisture. There are pieces of timber land where one-third of the trees are already dead from this cause. There are large tracts of rather light sandy and stony land and also some that is too hilly for cultivation. Such lands could be planted to forest trees and made to produce a good crop of timber. There are varieties of trees that do well on such lands.

Many farmers have to buy their wood at the present time, and wood is cheap compared with the limited supply, but it will not long remain so under present conditions.

ANNUAL MEETING, 1901, MINNESOTA BEE-KEEPERS' ASSOCIATION.

DR. L. D. LEONARD, SEC'Y, MINNEAPOLIS.

The annual meeting of the Minnesota Bee-Keepers' Association was held Dec. 4 and 5, 1901, at Minneapolis. It was a very interesting and profitable meeting to the members present. It was unfortunate that no stenographer was provided for, as a number of interesting talks were made which as far as publication is concerned are a dead letter.

Mr. William Russell, president of the association, called the meeting to order. The first business was a report of the committee appointed last year to look after the adulteration of honey in this state. The committee has kept in touch with the Dairy and Food Commission of the state and has urged, in season and out, the necessity of obtaining samples of honey and having them analyzed and reported upon and the seller and manufacturer warned if the goods were not as represented. This has been done in a number of cases this year, as well as in several years past, and although there has been little prosecution, the moral effect seems to be growing, and there is not by any means the proportion of adulterated honey sold now as has been in the past. This matter of adulteration is one that must be constantly looked after by somebody, and in the end is bound to be stopped.

During the year the Minnesota State Fair Association built a new and spacious building at the state fair grounds, and

through the efforts of a committee from the Bee-Keepers' Association a considerable space was allotted to honey exhibitors—in fact, all that was needed. This was highly appreciated by the bee-keepers, as heretofore the space has not been half large enough. The exhibits of honey at the fair in September were very fine—in fact, one of the most attractive features. It was under the direct supervision of Mr. F. C. Erkle.

Probably the most important action taken at the meeting was the joining of the National Bee-Keepers' Association in a body. Every member of the Minnesota Bee-Keepers' Association who is in good standing now becomes a member also of the national association. Now the National Bee-Keepers' Association has for its objects two prominent features; first, the intellectual and moral advancement of the bee-keepers who are its members; second, the protection of such members in their legal rights as bee-keepers. This last means that when a bee-keeper who is a member is attacked and persecuted by any one whomsoever on account of his bees, he will be defended by the association, and the bills paid out of the treasury. This action of the association ought to bring in every man in Minnesota who keeps bees, and who in consequence is liable to get into trouble on their account. The dues are only one dollar per year, which includes dues to both associations, and entitles the member to this protection. Send $1, and your name and address immediately to Mr. L. E. Day, treasurer, Clinton Falls, Minn., and he will do the rest.

The following officers were elected for the coming year:

President, Mr. Wm. Russell, Minnehaha Park.
First vice-president, Mr. G. A. Forgerson, Rosemount.
Second vice-president, Mr. G. H. Pond, Bloomington.
Third vice-president, Dr. Mary McCoy, Duluth.
Secretary, Dr. L. D. Leonard, Syndicate Block, Minneapolis.
Treasurer, Mr. L. E. Day, Clinton Falls.
Executive Committee—Mr. H. G. Acklin, chairman, St. Paul; Mr. Van Vliet, Farmington; Dr. E. K. Jacques, Robbinsdale.

Insect Powder Plant.—Persian daisy, Pyrethrum roseum, when dried and pulverized is a powerful agent for driving away insects. It can be grown from seeds like any other feverfew, and the blooms can be cut and dried at home with decidedly less expense than the powder can be bought. The seedlings may occupy prominent borders in the flower garden or fill entire beds. Also the same culture that suits vegetables will make the daisy yield abundantly of the useful blooms.—G. T. D.

ANNUAL MEETING, 1901, NORTHEASTERN IOWA HORTICULTURAL SOCIETY.

JONATHAN FREEMAN, DELEGATE, AUSTIN.

In company with J. C. Hawkins, president and delegate from the So. Minn. Hort. Society, your delegate reached Rockford on the evening of Dec. 16, finding several of northern Iowa's workers in horticultural lines at the Beebe House.

The evening was pleasantly and profitably spent in becoming acquainted and conferring with several of the horticultural war horses of the district. The following forenoon was improved by making acquaintances in the hotel lobby, and finally gathering at the cosy Baptist church building, the place of meeting of the society, where some time was utilized in further conference, arranging and examining exhibits.

The efficient secretary, C. H. True, was promptly on hand, making all possible efforts necessary for a successful meeting. His exhibit was fine and instructive, consisting of home dried apples, several varieties of nuts, and a splendid showing of tree sections, including twenty apple varieties, six plums and thirty native woods. It must have required much labor and care. It was very interesting to both the old amateur and the youth. I believe the exhibit was handed over to the Rockford high school.

The number of fruit exhibits was surprisingly small, but the few specimens were good. The duties of the fruit committee were not onerous.

The meeting of the society properly opened Tuesday afternoon, with President Reeves in the chair.

The reports of the district directors, as a whole, were in the same line, and largely a duplicate, in experience and observation, of those of our own vice-presidents in the southeastern portions of the state.

Within the limits required, it will be impossible to give a full report of papers and discussions, unless it be dry as dust; hence I will only note a few salient points as they may appear to the writer.

The greeting and response by Dr. L. Brown and W. H. Guilford were happy and permeated with good will and good sense.

Rev. C. Marshall, who, as age is slowly creeping forward, is giving less time to the ministry and more to horticulture, gave a pleasing and polished address, full of the "Perplexities of a Beginner."

The president, Elmer Reeves, of Waverly, in his annual address, which was concise, definite and forcible, referred to many requi-

sites; among them trimming, fighting insect enemies and proper packages for delivering fruit. Prominent mention was made of preliminary efforts in the direction of forestry in Iowa; of the "Wealthy apple fund," and words of kind remembrance of Messrs. Gardner, Speer and Dartt, who were not able to be present because of physical infirmities.

Messrs. Eugene Secor, C. G. Patten, C. H. True, A. E. Bentz, G. A. Ivens and Clarence Wedge in their usual quiet manner gave their candid suggestions and advice on "The Coming Winter Apple," "Care of Nursery and Orchard," "Traps and Spraying," "Small Fruit Lot," "Grape Growing," and "The Austrian Pine," as follows: Malinda, N. W. Greening and Walbridge recommended; clearly revealing the necessity of far better care on the part of nurseryman and farmer; illustrated by trap for moths; traps versus spraying; tree paint, and its merits, as claimed by J. W. Flackler, of Ely; persistent watchfulness and cultivation; distant rooting of runners give the weakest plants; strong defense of grape culture, notwithstanding the cheap price of eastern raised grapes; giving a concise history of the merits of the Austrian pine in contrast with other pines in southern Minnesota.

Of course, when J. S. Trigg, Edson Gaylord, W. H. Guilford, W. A. Burnap, J. R. Waller and "Apple Tree" Barnes get the floor on "Orchard Enemies," "Improved Methods," "Marketing Fruits," "Horticultural Stumbling Blocks," "Ideal Garden," and "Barnes' Address" you may look for "rattling of the dry bones," and some instructive music by the "horticultural band:" Remedies and preventatives against enemies; white wire netting; wood protectors; thick planting on southwest; don't pasture; no blue grass; mulching; cultivation; poisoning rabbits; and currant bushes on the southwest, or towards 2 o'clock sun; northeast location; no protection; hardy roots; head and graft toward the 2 o'clock sun.

Let birds have poor, wormy cherries; cut stems of fruit when picking; several pickings; and plant more cherry trees to stand off the birds.

Lack of faith; want of action; wrong location; wrong varieties; wrong handling and planting; wrong cultivation; pruning; protection and marketing.

Rows straight and long for cultivation; yearly manuring; hang tomato vines in window for ripening; and shoot poultry depredators as wild game.

Received gold medal at Buffalo; spray three times; thin apples; alternate rows of different kinds of trees; dynamite the ground

for planting—a valiant defender of Wisconsin in all its mighty efforts to compete with Iowa and Minnesota.

Mrs. J. R. Waller and Mrs. William Smyth, of Rockford, read fine, able and instructive papers on "Preserving Fruit for Home Use," and "The Culture of Flowers."

At one session, through the kindness of G. A. Ivins, all present had the privilege of sampling that beautiful, large, bright red apple, the "Arctic." Its several claimed merits are being highly extolled, especially its keeping qualities, by the few who seem to be acquainted with it, both east and west. C. G. Patten gave a brief and intelligent report of fruit exhibits at the Pan-American exhibition, and also made an impressive plea for home and country decoration with our native trees.

E. H. S. Dartt, of Minnesota, was not able to be present, but sent a concise and explicit paper on "Public Parks."

On Wednesday evening the citizens of Rockford gave one of the very best amateur musical and literary programs that the writer was ever privileged to enjoy. It was an entertainment indeed.

On Thursday evening after business was completed Mr. Guilford instructed us for a time with an interesting talk on "Plants, Shrubs and Flowers for the Park or Lawn."

The Minnesota representatives are impelled to refer to their royal treatment by the officials of the society, and the citizens of Rockford. They were greatly honored in being entertained most generously at the cheerful and well equipped home of one of Rockford's old and prospered merchants and his estimable wife.

We were also privileged in visiting the editorial "den" of J. S. Trigg, where the weekly three-columned digest of "Farm, Orchard and Garden" is prepared and sent broadcast over the land in hundreds of papers, enlisting the attention and instructing and encouraging at least 2,000,000 readers. Mr. Trigg has recently purchased twenty acres of apple orchard of L. B. Dumbolton, who will soon return to the home of his youth, at Oswego, N. Y., to follow fruit culture there. The above orchard is about five years from planting, consisting largely of Wealthy and Patten Greening. Horticulturists are considerably interested in the outcome of this venture by Mr. Trigg, and so is he, as we would infer from his many forceful and pertinent questions asked of those who read papers before the society.

ANNUAL MEETING, 1902, MINN. STATE AGRICULTURAL SOCIETY.

OLIVER GIBBS, MINNEAPOLIS.

The State Agricultural Society and Stock Breeders' Association (in joint session) closed another successful three-day annual meeting, at the capitol in St. Paul, Thursday noon, January 16th

The program as rendered, differing slightly from the one previously announced, was as follows, with lively discussions of the addresses and papers:

Address by Governor S. R. Van Sant. Paper on the growth and development of the state agricultural resources, by E. D. Childs, of Crookston. Paper by S. L. Moore, general freight agent of the Northern Pacific railway, on the stock raising industry of Minnesota from the standpoint of a railroad man.

Address by M. F. Greeley, of South Dakota, on the development of the sheep industry, and by Prof. A. M. Soule, of Tennessee, on the relative conformation sought in beef and dairy cattle.

Supt. O. C. Gregg, of the Farmers' Institute, spoke on the improvement of Minnesota cattle, and Prof. W. M. Hays, of the School of Agriculture, on the breeding of animals for intrinsic qualities.

Prof. Soule also read a paper on the influences affecting the economic production of beef.

On Wednesday afternoon the societies listened to an interesting address by Mrs. Bramhall, of St. Paul, on the forestry reserve question, and voted to indorse her plans by sending their resolutions thereon to the Minnesota senators and representatives in congress.

Prof. E. S. Goff, of the Wisconsin School of Agriculture, read a good paper on tillage as a preventive of drouth.

The star effort of the day program was reserved for the last, and that was the address of Farmer A. P. Grout, of Winchester, drawings of the several types of profitable and unprofitable cattle, on the hoof and as dressed beef. Mr. Grout was the only speaker who succeeded in turning the entire audience to his view of the subject; even the chairs in the assembly hall all turned that way. It was a great scoop for Farmer Grout among so many learned professors of agricultural science.

Wednesday evening, the 15th, the boys and girls of the agricultural school, Dean W. M. Liggett presiding, gave an entertaining program, as follows, receiving a handsome testimonial of their proficiency in the applause of the audience at the time, and

in resolutions complimentary to the school, passed the next morning:

Bridal Chorus, by Cowen.....School Chorus
Feeding Live Stock.....H. A. Ludke, Willow Creek, Minn.
Value of Orchard and Garden Products to the Home....
.....Ralph C. Miller, Bloomington, Minn.
The Housekeeper's Week. Miss Mabel A. Wells, Monticello, Minn.
Retaining Fertility on a Grain Farm.....
.....J. N. Holmberg, Renville, Minn.
Selection.... .....Boys' Glee Club
The Blending of Foods.....Miss Mary B. Koch, Litchfield, Minn.
Producing Forage under Conditions of Drouth.....
.....E. H. Riley, St. Cloud, Minn.

Thursday morning was devoted to the passage of a lengthy series of resolutions, the hearing of reports, and finally to the election of officers, with the following result:

OFFICERS.

President, C. W. Cosgrove, Le Sueur; vice presidents, C. R. Smith, St. Paul; B. F. Nelson, Minneapolis.

BOARD OF MANAGERS.

N. S. Gordon, Crookston; J. C. Curryer, St. Paul; L. D. Baird, Austin. Hold over members, W. M. Liggett, St. Anthony Park; J. M. Underwood, Lake City, and W. G. Sawyer, Partridge.

Prof. Thomas Shaw, secretary of the Stock Breeders' Association, sprang an agreeable surprise by distributing his annual report, containing all the papers and addresses of the last annual meeting of the two societies, held a year ago; and Secretary Randall another one by having a corps of stenographic reporters on hand to take down the impromptu addresses and discussions of the present meeting, which are to be printed, together with all the papers and reports, for distribution to the members. Any other person can get a copy by sending him a request by postal card or otherwise.

Remember the secretary's address, E. W. Randall, Hamline, and be sure and send for the full report. Its value will be very great to all reading, thoughtful farmers or students of agriculture.

The Horticultural Society was represented by Pres. W. W. Pendergast, Ex-President J. M. Underwood, Secretary Latham, Wyman Elliot, Prof. S. B. Green, and others, either as members or as speakers in discussions.

A feature of the governor's address, gratifying to horticulturists, was his statement that Minnesota seems to be coming to the front as a fruit producing state, in addition to her triumphs in

stock raising and dairying, as indicated by her immense state fair exhibit of apples, grapes and plums.

In this connection it may not be amiss to state that Minneapolis and St. Paul handled last year 230,000 barrels of apples and 600 car loads of other deciduous fruits; and the two dozen or so orchards in the state showing crops of 500 to 2,000 bushels of apples each, do not as yet, with all the smaller orchards, cut much figure as against the enormous totals that the market demands, so that for some time to come there is not much danger of over-home production, perhaps never will be, for our apples are of such beauty and quality as to out-sell any of the shipped-in sorts whenever offered. Instance, our Wealthy, now extensively grown in Washington and Oregon, are all snapped up there in the home markets, not a barrel of them allowed to go east for the general markets the past fall or winter; so the local commission men in Minneapolis and St. Paul tell me.

ANNUAL MEETING, 1902, SOUTHERN MINNESOTA HORTICULTURAL SOCIETY.

MRS. C. E. BRAINERD, SEC'Y. ALBERT LEA.

The opening session was called to order Wednesday, Jan. 15, at 1:30 p. m., with the president in the chair.

The program was carried out just as printed. The papers were interesting and instructive, and after each paper a general discussion followed. A motion was made and carried that a vote of thanks be extended to Mrs. Jonathan Freeman for her most excellent paper, which Mr. Freeman read on account of his wife's ill health.

The Wednesday evening session abounded in good things. The address of welcome by Burdette Thayer, and the response by Jonathan Freeman, were both eloquent and convincing. The paper by E. F. Peck, entitled "Road to Failure with the Potato Crop of 1901," convinced the people that Mr. Peck knew just what he was talking about. R. Parkhill, the "poet" of the society, gave some original verses entitled "The Garden of Eden." Mrs. Hill's paper, "The Surroundings of a Country Home," was practicable and well handled. Mr. Bent, of Cresco, Iowa, read an entertaining paper, which brought out a good discussion. The subject was "Tree Planting and Fruit Growing."

Thursday morning we listened to papers by Jens Jensen, F. A. Ticknor, J. C. Hawkins, Clarence Wedge and H. Hansen. The subjects were all of much interest to fruit growers. Jens Jensen's knowledge of plums is worth a great deal. Mr. Ticknor's hobby is the interesting one of bees and horticulture. Mr. Wedge is too

well known to waste any printers' ink upon him. Mr. Hansen, the strawberry man, gave a paper on strawberries that was full of solid facts.

Thursday afternoon was a perfect feast, and a delight to every one present. The subject, "Seedlings," by Clint Luce, editor of the Albert Lea daily paper, was an artistic creation of ideas and suggestions of how to raise and care for seedlings. Mr. Moore read a paper entitled "Root-Killing in the Orchard," which brought out the best discussion of all the subjects presented. Mrs. Olberg, of Albert Lea, gave an entertaining paper on flax. She had flax spinners with her, which interested the audience very much. There were a large number of ladies present, and Mr. P. Clausen, of Albert Lea, addressed them on the cultivation of carnations. Every lady present that afternoon was given six choice gladiolus bulbs from the Wedge nursery.

Thursday evening the society was entertained by the home people of Spring Valley. The program consisted of instrumental and vocal music, essays and short speeches. The address by A. J. Philips, of West Salem, Wis., was full of wit and humor. He gained many friends, who will always be glad to welcome him whenever he comes.

Friday morning Mr. Livingston gave an illustrated paper on grapes. Then came the general routine business of the society, after which we were adjourned to meet in one year.

It was conceded by all present that this meeting was the most successful and the best attended of all the meetings of the society. Much credit is due O. W. Moore for its success.

The display of fruit by Clarence Wedge, J. C. Hawkins and Mr. Jensen was a great attraction.

OFFICERS FOR 1902.

President—O. W. Moore, Spring Valley.
Secretary and Treasurer—Jonathan Freeman, Austin.
Vice-President, three years—B. A. Seelye, Preston, Fillmore county.
Vice-President, two years—E. F. Peck, Austin, Mower county.
Vice-President, one year—Mrs. C. E. Brainerd, Albert Lea, Freeborn county.

COMMITTEE ON SEEDLINGS.

Three years—B. N. Shaddock, Highland, Minn.
Two years—C. Morgan, Forestville.
One year—Geo. Prescott, Albert Lea.

FRUIT COMMITTEE.

Three years—L. O. Higby, Spring Valley.
Two years—L. W. Allen, Spring Valley.
One year—Jens Jensen, Rose Creek.

THE POLLINATION OF ORCHARD FRUITS.

PROF. F. A. WAUGH, BURLINGTON, VT.

The pollination of orchard fruits as a practical question in orchard management began to be discussed only about ten years ago. A great many hints had been thrown out here and there previous to that time, but no general theory seems to have been suggested until the date of which I speak. The need of cross-pollination was recognized by the fruit growers themselves, probably first with the native plums; and the fact that they are generally self-sterile was plainly set forth by Professor Bailey in his Bulletin No. 38 of the Cornell Experiment Station, which was the first satisfactory study we ever had of the plums native to America.

The first scientific study of these questions, however, was made by Mr. M. B. Waite, of the Department of Agriculture at Washington. His work was done chiefly with pears, although he experimented to some extent on apples. Briefly, he showed that many varieties of pears require cross-pollination, and that many others yield larger and better fruit when they are cross-pollinated. The publication of Mr. Waite's results, along with many other things, contributed to incite popular interest in this subject, and to induce a number of experimenters to take up the question in many ways, from many sides and with many fruits.

My own work has been done chiefly with plums, and, although I was preceded in this field by many other experimenters, some of whom secured substantial results from their work, I think it is not immodest to say that my experiments were the first ones of special importance dealing with plums. What I have to say here is necessarily based largely on my own experiments and practical observations in the field. But I shall not confine myself to the plum, and I shall try not to neglect the results brought out by scientists and practical horticulturists in all parts of the country.

THE PROBLEM STATED.

The facts with which we have to deal are briefly stated as follows: Many varieties of orchard fruits, especially plums, pears and apples, do not bear satisfactory crops when standing by themselves. Some do not bear at all. The trees of such varieties require to be mixed with trees of other more or less closely related varieties, or they require to be grafted with a mixture of two or more varieties. This general condition is summed up by saying that such fruits are self-sterile, and, as we shall see, the problem of self-sterility is the one with which we have chiefly to deal.

ABNORMAL AND DEFECTIVE BLOSSOMS.

As soon as this matter began to be observed the fruit growers and experimenters both found that a great many plum blossoms are imperfect. In the majority of such blossoms the pistil, or female organ, from which the fruit itself directly develops, is defective; sometimes it is entirely wanting. It is evident that a blossom having no pistil cannot produce a plum, and it is at least fair to suppose that any defect in the pistil renders the chance of fruit-bearing much smaller. Considerable attention was given, therefore, eight or ten years ago, to this part of the subject. It was found that in some cases all the blossoms on a tree were so deficient as to make fruitage impossible. Yet such cases were so rare, and the cases of comparative deficiency so unimportant, that altogether these considerations threw very little light on the general orchard problem of unfruitful trees.

While studying these plum blossoms to get a better knowledge of their deficiencies, many curious abnormalities were brought to light. In some plums the male organs matured before the female organs (at least, such was stated to be the case, although I have never observed this phenomenon). In a great many blossoms the female organs matured in advance of the male organs. In some cases the pistils were longer than the stamens, and in other cases the stamens were longer than the pistils. Such variations had been observed in other species of plants and had been found of the highest significance in explaining the pollination of those species. It was necessary, therefore, that the early investigators of the native plums should have looked for some explanation of the problems in hand in these abnormalities. At the present time it must be said that they have thus far explained nothing, and it now seems probable that they throw no light on the practical questions involved.

SELF-STERILITY.

Self-sterility, then, plain and simple, seems to be the main issue. In the ordinary typical case the plum tree bears an abundance of blossoms which are for the most part perfect, having all of the organs, both male and female, normally developed, and yet being incapable of fruiting by itself. The pistils simply refuse to be fertilized by the pollen from the same flowers or from other flowers on the same tree, or even from other flowers on other trees of the same variety.

The first practical question which naturally arose was as to the extent of this self-sterility. Some varieties were thought to

be self-fertile, although some were shown to be self-sterile. A great deal of work has been done in determining the characteristics of varieties in this regard. It is now possible to find in various books and bulletins more or less complete lists of the varieties of plums, pears, apples, grapes and other fruits in common cultivation classified according to their self-fertility or self-sterility. I will not stop to present such lists here. It will be sufficient for the present to say simply that it has been found that plums are very largely self-sterile, cases of self-fertility being altogether rare; that a majority of pears tested show more or less self-sterility, and that the same is true of apples. Perhaps a quarter of the apples in common cultivation are totally self- sterile, another quarter are practically self-sterile and a third quarter need cross-pollination for the best results.

There has been some objection made to this summary way of classifying varieties according to their self-sterility or self-fertility. It has been said by the critics that these qualities do not belong specifically to the varieties, but rest upon many external and more or less incidental conditions. Self-fertility, these critics say, varies with the season, climate, locality, age and vigor of the tree, etc. While there is undoubtedly some truth in this view, it may be well to notice that for the present it rests almost purely on speculative reasoning. Nobody has made a satisfactory experiment to prove any of these supposed variations, and for the present these criticisms, though very interesting, may safely be discarded. At any rate, the question is of small practical importance, as we shall see further along.

THE REMEDY—MIXED PLANTING.

The remedy for all this unfruitfulness has already been named, viz.: the mixing of varieties either by planting several together or by grafting two or more into one tree. This is such a simple and easy matter, and the risks of self-fertility are so great, that it seems an altogether unjustifiable practice now to plant large blocks of apples, pears or plums of any single variety. There are, indeed, to be found many orchards of solid blocks of certain varieties through the country which bear fairly well or even abundantly, but they are exceptions. Solid planting is always risky, and there are enough risks in the fruit business without taking any gratuitous ones.

It has been objected by a few extensive fruit growers that mixed planting is really troublesome. They say it is easier to handle a

block of a single variety, both in cultivation and in picking the fruit, and that unless mixed planting is shown to be absolutely necessary such advice as we have been driving toward in the foregoing discussion is dangerous. Personally, I think these men minimize the dangers of solid planting, and magnify the difficulties of mixed planting. If one were to plant a hundred and sixty acres in any class of fruits he would hardly want to put the whole area to one variety, even though that variety were Ben Davis apples. If two or three varieties are to be planted it is just as easy to put them into strips a half mile long and three or four rows wide as it is to put them into two eighty-acre blocks. I think that the general opinion of practical fruit growers will bear me out in this.

Attention should be called at this point to the fact already mentioned, that many varieties which are not strictly self-sterile bear more and better fruit when suitably cross-fertilized. In many cases this amounts to a great deal. Particularly when larger and better looking fruit is secured, as is often the case, it has a direct influence on the cash account, and this is the supreme test in all experiments. The difference between No. 1 and No. 2 apples is not more than a half-inch in the measure of their diameters, but it is apt to be more than a half a dollar in the measure of their selling prices. If proper cross-pollination will put twenty per cent more of the apples in any orchard into the first grade barrels, then cross-pollination had better be looked after.

MUTUAL AFFINITIES OF VARIETIES.

When the experimenters first began to tinker with these questions they were all apparently possessed of the feeling that striking mutual affinities and distastes existed amongst the varieties of plums, pears, apples, etc. The notion was, for instance, that though Hawkeye might fertilize De Soto well enough, it still might be of no value whatever in fertilizing Weaver or Miner, Ocheeda or Rollingstone. Several of us inquisitive chaps spent a long time, therefore, in prying into the private affections of our friends in the orchard. It must be said that if they had any such private predilections they kept them well to themselves. All the teasing little experiments yet performed have failed to bring out more than what would make a good society scandal for a sensational New York daily. At the present time it seems fairly certain that these special proclivities cut no figure with the practical orchardist—at least not in the present stage of our pomological development. One variety will pollinate almost any other variety, providing that the two blossom at the same time.

BLOSSOMING PERIODS.

In fact, this question of blossoming at the same time turned out to be of more practical consequence than many of the more beautiful and recondite theories of the laboratory horticulturist. There are so many varieties of plums, and they belong to so many different species, with qualities so highly diverse, that it is very easy, taking it by and large, for one variety to miss another in its blossoming season. Further south this study of blossoming seasons is very important, but for districts as far north as Minnesota and Vermont it is of much less consequence. The entire blossoming season is much shorter here, and, moreover, we do not cultivate so many species. The various classes of plums which extend the blossoming season so greatly in the central and southern states are almost unknown in our orchards. It is a question which the practical grower needs to keep in mind, but which he need not lose much sleep over while he lives in the salubrious climate of Minnesota.

AGENCIES OF POLLINATION.

Before leaving the subject it is almost necessary that a word should be said regarding the means by which the pollen is carried from one tree to another. Most persons have supposed that this was done largely by the wind, and out on the plains, where wind is plenty and cheap, that view has very naturally taken strong hold. The only difficulty with it is that it does not agree well with the facts in the case. The pollen of apples, pears and plums is usually gummy, sticky, viscid, adhering to whatever it touches, and not inclined to move about in the wind. Of course during those delightful spring days at plum blossoming time, when the wind occasionally blows with a force equal to the business of moving a stone fence, it is not unreasonable to suppose that even the sticky and unwilling pollen might be moved somewhat out of its tracks. Still one will see that the pollen masses would cling together, and would soon lodge on the ground rather than on the pistils for which they were meant, and that the whole business would be poorly and inefficiently done.

The real work of scattering pollen, in ninety-nine cases out of a hundred, is done by the bees, especially the wild or cultivated honey bees. The gummy, mucilaginous pollen sticks to them, the hairy surface of the insect body being specially suitable for sticking purposes, and the bee passes from tree to tree laden all over with yellow fertilizing material. Cases have been called to

my attention in which it seemed doubtful about the bees really having done the work, and I do not wish to assert that they are the only salvation, for the self-sterile apple, pear and plum trees. Nevertheless, their importance has been greatly under-estimated hitherto, and I think we can afford to give them greater consideration in the future.

GENERAL RULES FOR MIXING.

A question which is very commonly asked is this: "How far apart should varieties stand for the best results in cross-pollination, and how should they be placed with reference to one another?" When it was supposed that the wind was the principal agent in cross-pollination it was usually recommended to plant the varieties in rows east and west, so that the prevailing south wind of the spring season could carry the pollen northward across the rows Perhaps such an arrangement is still the best, since the wind probably has some influence in certain cases, and since the bees also may travel more or less with the wind.

With varieties which are distinctly self-sterile—and this is especially true of plums—not more than three rows of one variety should be planted next to one another. When a large plum tree is in full blossom it presents an extensive field for the activities of even the most able-bodied bee. A bee is apt to get his load from two or three such trees and go home to the hive. He may, therefore, spend all his time on the Stoddard rows, without getting across to the rows of Surprise waiting next in order. For myself, I should think that in handling plums, alternate rows would be more satisfactory, giving just a single row to each variety. With apples and pears I should feel perfectly safe in putting two, three or even four rows of a single variety, but more than that I should regard as infringing on the limit of safety.

CONCLUSION.

In concluding this talk I feel like drawing a moral for more general application. It seems to me that the problems connected with the pollination of orchard fruits have been pretty well worked out, the difficulties have been thoroughly fought over, and fairly satisfactory conclusions have been reached in all the practical questions involved. We are ready to go on to something else. Thus the questions come up one by one. Each generation has its own problems and its own difficulties, which it has to meet under new conditions, and until one problem is solved a new one cannot be taken up. We have to do our part for the progresive develop-

ment of horticulture, and it is much to the credit of the Minnesota Horticultural Society that it has been so strong a mover in the advancement of civilization along pomological lines.

One thing more: The men who have taken this question up on the practical side, and who have examined it thoroughly in their own orchards, have received a far larger benefit than they anticipated at the outset. They have been able not only to discover practicable means of making their trees more fruitful, but they have had a deeper insight into the whole broad knowledge of pomology. They have been made better horticulturists in every way. They have grown more into love with their calling through coming into closer contact with their trees and vines. No man can take up the investigation of any one question in his own orchard and follow it out earnestly and honestly without having his views broadened in every direction. And I may close by presenting the still plainer fact that no man can broaden his views on these subjects without becoming a more efficient cultivator of the soil, making more money out of his fruit, being a better horticulturist and a better citizen.

THE "GIDEON MEMORIAL FUND" INSPIRES TO RHYME.—A contributor to this fund works off his surplus enthusiasm in the following rhymes, which, as he suggests, limp a little on "club feet," but in sentiment are sound:

THE WEALTHY APPLE AND "GIDEON'S BAND."

"Of all the known fruits, the apple is king,"
We've always heard that the poets do sing.
It's too vast a theme for man to grapple,
This beautiful, red cheeked, Wealthy apple!

Gideon, the famed originator,
Takes high rank as public benefactor,
A "living monument" we now will raise,
That "students in agriculture" will praise.

Unlike Gideon of old, with unstained hand
Our Gideon led a more peaceful band.
Pomol'gists of the world his works adore,
"School of Agriculture," opes wide her door.

Students of all coming generations,
Who are subject to many privations,
Will gather inspiration from our gift,
As our good yearly prizes they do lift.

Harbor View, Fla., Jan. 1, 1902. —Sam Bucus.

Secretary's Corner.

APPLE SEED FOR DISTRIBUTION.—Prof. Green has a quantity of apple seed, saved from different varieties of apples which ripened at the Experiment Station last summer, and will send it out to applicants for a small charge, a package of one ounce for ten cents, intended to cover the expense. Address, Prof. Samuel B. Green, St. Anthony Park, Minn.

PLENTY OF WINTER APPLES.—"We are going to have plenty of winter apples as soon as they can be propagated and put on the market. We expect to have plenty of apples to use every winter without having recourse to cold storage when our apple trees bear. The day for saying that we cannot raise winter apples in Minnesota is past, for there are lots of winter apples raised all over the country, and some of them are pretty good eating." S. D. Richardson.

REPORTS OF MEETINGS IN THIS NUMBER.—The report of the annual meeting of the Northeastern Iowa Horticultural Society, by the delegate, Jonathan Freeman, is to be found in this number; also reports of the recent meetings of the Minnesota Bee-Keepers and the State Agricultural Society. Please note them. A report of the Wisconsin Society's meeting, to be held Feb. 3-6, will appear in the March number, by our delegate, Wyman Elliot, and of the So. Dakota meeting by L. R. Moyer.

GROW NATIVE GRAPE SEEDLINGS.—"Why not our grape hybridizers who really want to give the cold North something truly ironclad in the way of hardy roots and tops for our coming choice new cultivated grapes, work from our best wild western native grapes? I do not remember seeing a native grape injured in the top or root by the hard winter of 1899-1900, which killed nearly all vines of our cultivated sorts. Let everybody help grow choice new ironclad native grape seedlings." F. K. Phoenix.

THE WEALTHY A "SURVIVAL OF THE FITTEST."—A Colorado exchange has the following, which will be of interest to growers of this fruit:

"The worst insect of all is the codlin moth, against which the apple growers must wage continual warfare. A novelty in apples, however, is to be found far up the valley about Salida and Buena Vista. At an altitude of six and seven thousand feet wormless apples of two varieties can be grown—the Wealthy and the Yellow Transparent. The spring frosts are so severe as to kill the insects, yet these two hardy varieties of apples can withstand the frosts."

RESOLUTIONS ON DEATH OF J. S. HARRIS.—The following resolutions were unanimously adopted at the late annual meeting of the Northeastern Iowa Horticultural Society:

"Resolved that this society joins with its sister societies of Minnesota in mourning for the death of that earnest worker, valued citizen and true man, Mr. J. S. Harris, late of La Crescent, Minn., and with them we extend our heartfelt sympathy to his immediate friends and family for this, their and our great loss."

A HORTICULTURAL CLUB AT CONSTANCE, MINN.—A club has lately been organized among the farmers living about Constance, Minn., entitled "Farmers' Horticultural and General Improvement Club." The name sufficiently indicates the purpose of the organization. The active membership at present stands at ten, and the society has allied itself with the state organization. The president is John P. Ness; secretary, Fred Johnson. There ought to be a hundred such organizations in our state. They would be found exceedingly helpful and a source of much social enjoyment as well. Address the secretary for suggestions for the formation of such organizations if you are interested in forming one in your neighborhood.

H. M. Lyman

LATE OF

EXCELSIOR, MINN.

THE MINNESOTA
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In Memoriam.

HENRY M. LYMAN.

DIED JAN. 4, 1902, AGED 73 YEARS.

Henry Martyn Lyman was born in Easthampton, Mass., Sept. 13, 1828, being of English ancestry, a descendant of Richard Lyman, who came to America in 1630. Mr. Lyman received his education in the public schools and at Williston Seminary, in Easthampton. At the age of fourteen his father died, and he, with the assistance of his mother and older brother, carried on the New England farm.

In 1850 Mr. Lyman landed at Taylor's Falls, Minn., remaining a year and a half, after which he returned to his old home in Massachusetts. In the spring of 1853 he again set his face toward the west, landing at St. Anthony, Minn. Here he purchased an ox team, a wagon and some lumber, and drove west, landing on the afternoon of May 18th at the present site of the Lyman homestead, in Chanhassen, Carver Co., Minn. He set up the few boards he had brought with him against his wagon and called that home. Shortly after he built a log house of tamarack, broke land and raised vegetables, grain, etc. He returned to Massachusetts in the fall of 1855, and was married to Martha C. Pomeroy, of Southampton, April 13, 1856.

Mr. and Mrs. Lyman now came west to try their fortunes in the new territory, taking up housekeeping in the little log house, previously built by Mr. Lyman.

Many will remember Mr. Lyman as being postmaster for a num-

ber of years, having one of the first postoffices in Carver county. He was clerk of the first election held in this section of the country.

Mr. Lyman was very much interested in fruit growing. He probably planted the first apple tree in Carver county, bringing with him six small apple trees and seeds, which were planted in the spring of 1853. These trees not being adapted to Minnesota climate were killed in the winter of 1856.

In the year 1867 he planted seeds from apples of hardier varieties, originating many valuable seedling trees, one of which, the "Lyman's Prolific" has a spread of over forty feet, and has borne as much as thirty bushels of fruit at one time. From "Wealthy" seeds that he planted in 1876 there are now growing many varieties of large type of apples of good quality, which have captured leading prizes at the state fair and winter meetings of the State Horticultural Society for a number of years. Many varieties are good keepers.

He was also very much interested in the growing of evergreens, having one of the best evergreen windbreaks in the country. Many evergreens of his early setting tower over fifty feet high.

Mr. Lyman is survived by his wife and three sons, Albert H., and Frank J., of Excelsior, and Arthur B., at the old homestead. He was a devoted Christian, being an active member of the Congregational church of Excelsior, of which he had been a member since its organization.

Mr. Lyman became a member of this society in 1891, and the same year a society trial station was located on his grounds, which he continued to operate as superintendent, making annual report thereof till his death. In 1900 he was appointed treasurer of the society for that year, but declining re-election, his son, Arthur B., was elected his successor and still continues to hold the office.

As a horticulturist, Mr. Lyman has left a most honorable record, and the good he did in the direction of creating a pomology adapted to this comparatively new country will undoubtedly perpetuate his name long after those who knew him personally have passed away. We honor and love him, and his memory is that of one who fought well the battle of life and achieved success in its highest sense.

Vice-Presidents' Reports, 1901.

VICE-PRESIDENT'S REPORT, FIRST CONGRESSIONAL DISTRICT.

JONATHAN FREEMAN, AUSTIN.

The method of this report, whether good or bad, is my own; but I have been assisted by two leading horticulturists in the district in the listing of names of those who would probably answer communications, and in the suggestion of questions.

The report will largely consist of information outside of my immediate knowledge, as kindly rendered by others. A list of nine questions was printed in circular form, and, with more or less of my own handwriting, was mailed to sixty different persons within the district. Thirty-three acknowledged its receipt, and inclosed from *part* to a *full* answer and a review of the year's experience within the field of observation. I highly appreciate the spirit and the efforts made upon the part of those who answered. Because of infirmities and little practice in writing on the part of some, I well know it required great determination to fulfill my request; but their efforts are highly appreciated, as they were enabled to record some of the most vital facts for the interest and benefit of our work.

Question 1. Are the older orchardists continuing their past interest in the work, as illustrated by proper care of the old trees and plants, and in planting more space to the best of the old varieties and the well tried of the new?

"Many of the first orchardists of the district have been gathered to their 'long rest' to receive the reward of the faithful, but all continued loyal to our horticultural interests, in caring for the old orchards and planting new ones." Some, still living, possess their former interest in fruit-growing, properly caring for the old trees and plants, and extending their bounds by planting more of the

best of the old and new varieties. Quite a per cent of the older men are discouraged, and neglect is manifest; while a few are completely disgusted and doing nothing in the line of fruit culture.

Question 2. What average annual per cent of new men are planting more or less fruit trees and small fruits? And what average annual per cent of increase in the purchase of trees and plants by all? Also what is true of the purchase of forest and decorative trees and shrubs?

A fair per cent of younger men, sons of the first settlers, as they come to maturity, are planting and manifesting considerable interest. A large per cent of the new men, coming from other sections, are thus doing, resulting in an annual increase of trees and plants purchased, of from fifteen to seventy-five per cent. In the eastern part of district many forest and decorative trees are taken from the natural forest, but to the west they are almost entirely purchased from the nursery; and the annual increase of sales are from ten to one hundred per cent, largely because of the manifest necessity of shelter belts for protection, not only from the wintry blasts "but for the shielding of fruits from hot winds, sun-scald, etc."

Question 3. What six varieties of apples for the past six years have proved the most remunerative in their order per tree for selling in the markets within your reach?

Votes: Wealthy, 28; Duchess, 25; Patten Greening, 10; Longfield, 9; Malinda, 6; Northwestern Greening, 5; Hibernal, 6; Fameuse, 5; Haas, 6; Anisim, 3; Peerless, 2; Tetofsky, 3; Utter, 2; Walbridge, 2; Transcendent, 6; Early Strawberry, 2; Whitney No. 20, 2.

Question 4. Please give the best six varieties each of apples and "crabs and hybrids;" four each of plums, cherries, strawberries and currants; three each of raspberries, blackberries, gooseberries and grapes for general planting.

Apples: Wealthy, 22; Duchess, 19; Longfield, 10; Patten Greening, 9; Northwestern Greening, 7; Malinda, 7; Peerless, 4; Hibernal, 4; Tetofsky, 4; Utter, 3; Nelson, 2; Okabena, 2; Walbridge, 2; Anisim, 2.

Crabs and Hybrids: Whitney No. 20, 12; Martha, 12; Early Strawberry, 10; Minnesota, 10; Transcendent, 8; Virginia, 7; Sweet Russett, 5; Florence, 3; Briar Sweet, 2; Dartt, 2; Hyslop, 2.

Plums: De Soto, 18; Wyant, 12; Rollingstone, 10; Forest Garden, 7; Surprise, 10; Cheney, 6; Stoddard, 5; Wolf, 3; Weaver, 3; Gaylord, 3; Ocheeda, 2.

Cherries: Early Richmond, 9; Wragg, 9; English Morello, 5; Ostheim, 4; Montgomery, 3; Compass, 2.

Strawberries: Bederwood, 15; Warfield, 13; Crescent, 9; Splendid, 6; Enhance, 3; Haviland, 3; Lovett, 4; Clyde, 3; Brandywine, 2.

Currants: Red Dutch, 12; White Grape, 7; Victoria, 5; North Star, 4; Long Bunch Holland, 4; White Dutch, 2; Cherry, 2.

Raspberries: Loudon, 14; Cuthbert, 6; Gregg, 5; Older, 6;

Turner, 4; Marlboro, 3; Ohio, 2; Philadelphia, 2.

Blackberries: Ancient Briton, 13; Snyder, 8; Stone's Hardy, 3; Badger, 2.

Gooseberries: Houghton, 7; Downing, 6; Red Jacket, 3; Pearl, 3.

Grapes: Concord, 11; Worden, 9; Moore's Early, 4; Brighton, 5; Delaware, 4; Janesville, 3; Campbell's Early, 2.

Question 5. Of the newer varieties of plums, what have proved the most desirable?

Surprise, 14; Aitkin, 2; Ocheeda, 2; Brittlewood, 2; Stoddard, 2.

Question 6. What late keeping apple seems likely to become most popular?

N. W. Greening, 9; Malinda, 9; Repka, 3; Walbridge, 3; Patten Greening, 2.

Question 7. What have been the special drawbacks or hindrances in fruit culture during the past year?

"Drouth, continued intense heat" mentioned by a large majority. "Late frosts, insect enemies, weeds and insufficient cultivation by several. "The cut worm" mentioned. "Inability to obtain reliable help, over-production of the year 1900 and the sale of worthless stock from the east and south by gangs of tree sharks."

Question 8. What new thing has impressed itself upon you the past season?

"That orchards should be cultivated as often as corn. Of two orchards of mine, one in grass and one with cultivation, forty cents per bushel difference in quality, and better yield, in favor of cultition."

"That we must irrigate and have an irrigating plant."

"Constant surface cultivation."

"Late keeping seedling apples."

"Patten Greening and Loudon impress me favorably."

"Spraying a necessity."

"That Minnesota ought to make an effort to supply the immense demand for Wealthy apples in the western states."

"Absolute necessity of thorough cultivation."

"General farming and commercial fruit-growing will not do together, as one or the other will likely be neglected."

"Cultivate more, cultivate early, stir the soil. Keep the grass and weeds down. Go slow on the new kinds. Let somebody else try them first."

"The Compass Cherry and Surprise plum."

"That in grafting Compass Cherry on plum stock, it reduces the cherry flavor of the fruit. I think by grafting them on cherry that it will be much better."

"Left my blackberries up last winter without cover. Was much impressed with the shortness of the crop; decided wouldn't do it again."

"Spray, mulch and prune; then no trouble raising apples."

"If farmers cannot do something to make perfect fruit, the tree

business will be dead. I note that apples from old trees are the worst. The Stone, a late blossoming variety, was the most perfect."

"What about spraying? Will it actually save the apple, or is it a fake?"

"The great increase of insect enemies of fruit, fruit trees, small fruits and shrubs, and the great need of a thorough extermination all along the whole line."

"Will have to spray fruit trees if we want the whole fruit, for the birds don't seem to get up early enough around here to catch the worms that make the hole in the apple."

"Sooner or later we have got to spray to get clean fruit, and the railroads ought to give us better accommodations in handling our fruit."

"Cut worms may be successfully controlled by the liberal use of bran moistened and sweetened and poisoned with Paris green, and persistently scattered over the ground infested."

Question 9. What are the indications of a crop for the coming season?

"Good, good, good, plenty of moisture, abundance of fruit buds, prospect of an abundant crop next year," expressed by a great majority.

"Fair growth of wood and well ripened," by several.

"Strawberries and raspberries are much reduced in vitality and not promising," by a few.

"Plums moderate; gooseberries and currants are likely to do about as usual," mentioned.

From the best information gleaned from the district it appears that all fruits in every section, with few exceptions, have yielded from nothing to fifty per cent of an average crop, and that the sales have commanded from good to high prices.

REMARKS.

"Twenty years ago planted hundreds of trees; all killed. Young men are continuing to plant."

"Many orchards have been set in the past few years, but are not fruiting as yet sufficiently to form an opinion. They are generally well cared for and are looking well. In a few years we will be able to make an intelligent selection."

"My experience is, that to have apples every year the trees must be fed. Mine are manured every year, and I have a fair crop very year. The Wealthy is the apple for the northwest, large, good color, and, if picked with care as soon as it begins to color, will keep as well as most winter fruit in ordinary farmers' cellars."

"Have one hundred new varieties of apples in cellar."

"Old orchardists more interested because they realize an increase of money value. Cherries, a dead letter. Grapes, nit."

"Have just returned from a trip through four townships in my own county; were raising some fruit in one township, a very little in another, but I did not see an orchard in the other two."

"I think the Peerless a much more hardy tree than the Wealthy and better fruit."

"Duchess have paid the best because orchards are oldest, but Wealthy is in best demand and brings highest price. Newer varieties of currants and gooseberries are coming to the front."

"The Transcendent crab is the very best for commercial purposess. The Morello cherry is the best and only cherry raised here successfully. Has fruited over thirty-six years. Have picked and sold 237 bushels in one season. Seedling apples of finest quality: Leona, season July; Alling, season June; Long John, April to May."

"If a tree gets damagd by a cold winter, cut back all limbs in spring, so that the top is not more than half size."

"I have many varieties on trial, but as yet they have not been proven. Am more and more of the opinion that the list to advise to the general planter should be kept low. The large cultivator or grower is himself better able to judge than the society can tell him, for undoubtedly he has or will give it study. Recommend only the old and sure ones. Better for the majority to plant two or three varieties and be sure, than many and failure."

"In my long experience, have tried at least 120 varieties of apples, and can now recommend not more than twenty varieties that I would set for an orchard, if age permitted. Patten Greening is a large and a fine apple, but falls from the tree too soon. Longfield is a good bearer, but fruit is too small for market purposes. The Anisim, though a beautiful color yet too small. The McMahon, unless near market and carried like eggs, they bruise. Would now set an orchard in the following proportions: Five Red Duck, 5 Glass Green, 5 Gilbert, 5 Yellow Sweet, 25 Wealthy, 15 Duchess, 20 Thompson, 10 Repka, 10 Malinda. Crabs or hybrids: Sweet Russet, Gideon No. 6 and Martha."

The facts and experiences as rehearsed in the thirty-three communications have been of great interest and benefit to me, and hope they may be the same to many others. Why are the reports so meager and discouraging pertaining to the cherry? It is a fruit that I especially love, and why is it not a success in the western half of the district? What is the force of suggestions made by a few that commercial orcharding and general farming cannot be successfully followed, as a rule, by the same party? Is it not one of the forceful reasons for the present disparity of fruit culture upon the prairie and upon the hill and bluff sections? Evidently, this is worthy of consideration at all horticultural meetings.

Also, from the many references in the communications, we seem to be following closely our eastern neighbors in the apparent necessity of "spraying."

The President: You spoke of the grafting on the sand cherry. Will the graft have anything of the vigor of the sand cherry?

Mr. Freeman: I cannot tell anything about it; these answers are all from my correspondents.

The President: I would like to ask Mr. Underwood that same question.

Mr. Underwood: I have never tried it, but I suppose it would very likely.

The President: Would the sand cherry take with the Morello cherry?

Mr. S. D. Richardson: I have tried the cherry on the sand cherry but with little success; however, the plum will grow very readily.

The President: But you did get the cherry to grow on the sand cherry?

Mr. Richardson: Oh, yes; out of one or two hundred I got perhaps half a dozen.

The President: Well, that would be sufficient for the purpose of experiment.

Mr. C. H. True (Iowa): I understood Mr. Freeman to say that the Peerless was regarded as a more hardy tree than the Wealthy. Is that his own opinion or that of his correspondents?

Mr. Freeman: Nearly all of this comes from my correspondents.

Mr. True: Well, is that your opinion?

Mr. Freeman: No, sir; I have not had the experience.

Mr. True: I thought it would not agree with the experience of others. I am simply seeking for information to take back to my constituents.

VICE-PRES. REPORT, SECOND CONG. DISTRICT.

C. E. OLDER, LUVERNE.

The fruit crop in the southwestern part of the state the past season was only fair, owing to the midsummer drouth and late spring frosts. Although there was a great diversity in yield both in location and variety, still, with the exception of the apple crop, which had its off year, we have no reason to complain.

In our part of the district plums were a failure, on account of the late frosts in the spring. In the upper part of the district, near Windom and above, there was a fair crop of plums and some of most excellent quality and quantity.

In the southern and western part strawberries were a splendid crop and prices good, but the drouth, setting in at that time, shortened the crop and reduced the size of the berries as well as the price. The dry weather after bearing nearly or quite ruined the beds and generally injured the growth of the new planting. As there are very few pieces having a good stand of plants, I look for higher prices for strawberries another season.

Currants and gooseberries were fairly good when trimmed up and mulched, as they should be in the spring.

Only a few varieties of raspberries withstood the drouth enough to make a crop. The Turner, planted in a grove under the trees, bore a good crop; Older, grown in rows in the open between two shelter belts, bore nicely to nearly the close of the season; Kansas about half a crop, under the same conditions; and Loudon almost a failure, with Columbias entirely dried up without ripening a berry.

Being an off year for apples, there were very few, but what there were brought good prices. The Martha crab blossomed very full, and the late frost killed every bloom, when other varieties like the Wealthy, Duchess, Whitney, Virginia, etc., were only partially injured. This may indicate that the Martha will not stand as much frost without injury as the other varieties in the blooming period.

The Wealthy seems to hold its own as the leading apple. All varieties have made a good growth and have ripened their wood nicely for winter.

VICE-PRESIDENT'S REPORT, FOURTH CONG. DIST.

W. J. TINGLEY, STILLWATER.

I am pleased to say that the outlook for the future of horticulture in my locality is very encouraging. Fruit trees came through the winter in good condition, with the exception of some varieties that made a late growth; in the fall of 1900 those were damaged some on the tops. Apples showed very little bloom, and after the frosts of May 23rd and June 7th, our prospect for an apple crop was blighted. Nevertheless, the show at the Stillwater Street Fair was very fine, fully equal if not excelling the state fair in quality, but of course not in quantity. It was very noticeable that the apple booth was the leading feature of the fair, and many expressed surprise that such fine apples could be raised in Minnesota, and could hardly believe that most of them were raised within a radius of ten miles of the city of Stillwater. The varieties most prominent were Wolf River, Okabena, Wealthy, Duchess, Hibernal, Patten Greening and others I did not know the names of. Crab apples: Whitney, Martha, Hyslop, Transcendent, Briar Sweet and Florence.

On my farm the Duchess apple did well on the low land, the frost seeming to have had less effect on these than on any other variety. In orchards that I visited, the Virginia and Martha crab bore the best.

The .plum crop was light on an average, but in some places

some varieties bore heavily. With me the Cheney, Forest Garden and a yellow plum I brought from Dakota, bore heavily; these three varieties the frost did not appear to have damaged. The heavy bearing, I think, was due to the treatment the trees received. Where the trees bore heavily they had been manured and cultivated, or heavily mulched with straw and manure. Rollingstone, Wolf and Weaver appeared to be damaged the most by frost. There are a great many other varieties growing, but I did not see them fruiting this season to any extent.

Raspberries were a fair crop this season, and with the good price brought it made the successful berry grower happy. Loudon is being planted quite extensively and is well liked. Turner is grown to some extent, and we like it for the home. Cuthbert has been our best yielder, where the canes were laid down and covered. The blackcaps are not grown to any extent, as they require winter protection. Columbia is doing well and is a great grower, but is not much planted as yet.

The strawberry crop was light, and the berries small but good in quality. Bederwood, Warfield and Brandywine did well with us.

Grapes were a fair crop and ripened well.

Currants were a good crop, and with us the best varieties were Stewart Seedling and North Star.

Evergreens are being planted to some extent. Our farmers are commencing to pay more attention to beautifying their homes. Scotch pine, white spruce and red cedar seem to be the most desirable varieties for our location.

VICE-PRESIDENT'S REPORT, FIFTH CONG. DISTRICT.

A. D. LEACH, EXCELSIOR.

The fruit crop in this district, so far as I have able to learn by observation and inquiry, was not up to the average.

Raspberries were badly injured in some localities, from lack of snow to cover the ground during the coldest part of the winter, but prices were good, and most of the fruit growers with whom I have talked had no complaint to make with the outcome of the crop.

Strawberries, as a whole, were a poor crop. Some were injured by the winter, and all were injured more or less by the late cold spell in the spring. In most cases the crop was a failure so far as profits to the grower were concerned. There were some exceptions in very favorable localities; one that come under my obser-

vation was at Mr. Shuman's, at Christmas Lake, where a very satisfactory crop was harvested.

Currants were a good crop and paid well where the currant worms were carefully looked after.

Gooseberries were a fair crop, but were somewhat affected by the mildew unless they had been carefully sprayed with the Bordeaux mixture.

As a whole, plums were a good crop, and prices satisfactory for the best kinds—and it does not pay to grow any others.

The Compass Cherry, which is much thought of by some, especially for canning and jelly, came near being a failure on account of the late cold spell and the birds.

Blackberries were a light crop, owing principally to drouth in July, which injured them in size and quality as well as in quantity.

APPLES.

During the month of August I visited a number of the best orchards in this vicinity, to satisfy myself as to the crop prospects and to learn what I could of the different methods of cultivation and their success, and to examine for myself some of the new seedlings of promise which are being brought before the public.

First I visited the orchard of Mr. H. M. Lyman. I found the orchard looking well and making a fine growth. The crop of apples as a whole, was small, but many of the young trees were heavily loaded with fruit—notably the Patten Greening, which the owner afterwards told me netted him $1.50 per bushel in Minneapolis. Two loads brought $150.00 net cash.

Mr. Lyman has a number of promising seedlings. Notable among them is a red sweet, which promises to be hardy and is of fine quality; he also has some late keeping seedlings that are attractive both for size and quality.

Next I visited the orchard of William Sarver. The young part of this orchard was bearing well. The old trees, with here and there an exception, were not full. Mr. Sarver is blind, but he has not lost interest in his orchard. He has about 1,100 trees in a young orchard that look very promising. His wife has the care of the trees and selling of the fruit, and is a genial and wide-awake horticulturist.

I also visited the orchard of Mr. F. J. Peterson, at Waconia. His trees were well filled with fruit—much fuller than in any other orchard I visited, but not so full as I have seen them before. Here I also noted some fine seedling apples that promise much, and also a tree of the Minnesota crab (so-called) that is one of the finest

apple trees I have ever seen in the state. I was surprised when Mr. Peterson told me they had never sprayed their trees. I missed the old gentleman much, for this is one of the families which to know is to love and respect.

I also visited the young orchard of Mr. O. H. Modlin, near Excelsior; it contains 1,000 trees, 600 Wealthy and 400 Patten Greening. It is one of the many promising young orchards in this vicinity. Mr. Modlin is a thorough horticulturist and will succeed if success is to be had.

I next visited the young orchard of Mr. H. W. Shuman, one mile south of Excelsior, and was shown over the grounds by our genial Mr. Wyman Elliot. The orchard is on a large hill, or, rather, around it. Friend Elliot led the way from the house, down across a hollow, then up that hill at a 2:40 gait. Having arrived at the top, I was formally introduced to his experimental work, which, to say the least, was worth climbing that hill several times to see. Seedling apples and plums galore, clean and thrifty. He told me much about this work—too much for my old head to retain, but you will undoubtedly reap the results of this labor in many new varieties added to our list of hardy plums and apples.

From here we circled down the hill, paying more attention to the orchard. The trees were thrifty and promising, and many of them, though quite young, were well filled with fruit. A plant is being put in here for irrigation, which I shall watch with much interest.

My own orchard bore a light crop, about half as many apples as last year. The fruit was under size as compared with other years, which was the case in all the orchards I visited.

My Duchess trees were well filled, as were the Patten Greening, and the Peerless were fuller than ever before.

My oldest University, received from Mr. Patten in 1892, had four bushels of fruit on it this year. They are fine, smooth apples of medium size, bright, golden yellow color, and fair to good in quality. The tree has shown no signs of blight. It is of spreading growth and appears to be very hardy and a handsome orchard tree. The apples are keeping in fine condition to the present time.

My apples netted me from $1.50 to $2.00 per bushel this year.

There was no blight to speak of, the Transcendents showing very little if any in this vicinity.

Grapes were a satisfactory crop, and prices were better than usual.

It is self-evident that in the fifth district apple culture is in-

creasing beyond anything we have ever had. I have lived in Minnesota forty-four years, and in traveling about the district I was very forcibly struck with the number of orchards being set out. What the outcome of this tree planting will be we cannot tell yet. They say this climate is moderating from year to year, and that we are not going to have any more hard winters, but I am not fully satisfied upon that score.

Mr. Elliot: In speaking of Mr. Sarver, the blind man, I wish Mr. Leach had gone a little further into details in regard to that orchard. I had the pleasure of visiting Mr. Sarver this past summer about the time the Duchess was ripening, and I was very much interested in what he has done. He is a blind man, cannot see a particle. When he goes out to his orchard he has to be led by some one, or else he has to take some familiar path. The help they have on that place of eighty acres consists of only three small boys, the oldest about sixteen. Mrs. Sarver is an ideal woman for a horticultural man to have. Mr. Sarver said to me, "We have eight hundred trees in our young orchard, and I have been over those trees three times on my hands and knees to take the weeds out of the rows." They have crops between the rows. He went over that orchard three times on his hands and knees. Last spring he rigged himself for spraying, and the orchard was sprayed five times. They sent some apples to the Pan-American, and the superintendent told me they were the finest lot of apples sent from this state. There was not an imperfect apple in the lot, and the Duchess were extremely fine. The trees were not as full this year as last, neither were the Wealthy, but they had a remarkably fine crop of fruit.

Mr. Underwood: I would like to ask Mr. Leach whether his orchard is thoroughly cultivated.

Mr. Leach: The young part I keep thoroughly cultivated. The old trees, the Wealthy which killed down in the winter of 1884-5, have grown up and are now bearing three or four bushels to the tree. They are set only twenty feet apart, and the limbs touch. I seeded it to clover, but I mow the clover and rake it up around the trees so it has killed the grass about as far out from the trunk as the top extends. I keep the ground free from weeds by mulching with green grass, and I also use some barnyard mulch every year, spreading it under the trees.

Mr. Underwood: If young trees that are not doing anything need thorough cultivation, that is, doing nothing but growing, don't you think that a bearing tree, bearing its burden every year, needs cultivation as much as a young tree?

Mr. Leach: Well, there is a difference in this way: I prefer to cultivate my older trees that are bearing by mulching rather than plowing up the ground. Many of us cannot do the work ourselves, we have to depend upon somebody else, and if I were to put almost any man into my orchard he would ruin the trees. I believe if the trees are kept well mulched and the mulching is

worked into the ground every spring, you will get as good results, and the ground will be in better condition to gather the fruit than it would be otherwise. Then another thing, the older the tree gets the more roots it has, and the more you cultivate the more injury you do to the roots, but if the trees are cultivated while young you can cultivate up to them without injuring the roots.

Mr. Underwood: I do not want the impression to get out from this society that the old tree can be left to itself. I do not want the idea to go out that old trees can be left to themselves, and my experience does not conincide with that of Mr. Leach that mulching will take the place of cultivation.

Mr. Leach: I do not cultivate the old trees with the team, because I cannot get in on account of the limbs. The most of the trees are not far enough apart so a team can be driven through with a wagon. I consider that my trees are equally well cultivated as I cultivate them as though they were treated like my young trees. They are clean from weeds for a radius of six to eight feet, and the ground is thoroughly worked.

Mr. Underwood: The roots of the trees go out further if they are twenty feet apart. I claim the bearing trees need every foot of the room, six or eight feet is not enough. They should have all the room there is, and there should not be a weed or any grass or clover grown in the orchard.

Mr. Leach: I shall have to differ somewhat with Mr. Underwood. All the success I have attained has been in the orchard seeded down when the trees came well into bearing.

Mr. Underwood: I venture to suggest that if you had taken care of your trees as you ought your trees would have borne more than they did.

Mr. Leach: I don't know that I have any fault to find with my trees; I was satisfied anyway.

Mr. Gibbs: Speaking about young trees, we often find in the fall after the ground begins to freeze it cracks, and that opens up the soil to exaporation just when the moisture should be conserved. They way I overcome that is to take my wheelbarrow and put about half a load of fine manure over those cracks; that stops the waste and helps the trees to get through the winter without suffering.

Mr. Elliott: I think that could be done with the harrow and cultivator.

Mr. Gibbs: But I do this after the ground is frozen; it could not be harrowed or cultivated after it freezes.

Mr. Underwood: If you were to cultivate before the ground is frozen you would not see any cracks.

Mr. Yahnke: Both gentlemen are right. (Laughter.) I want to say that when we were first married I told my wife that when we were both of the same opinion she was right, but if we differed in opinion, I was right. (Great laughter.) The gentleman says he likes mulch; but then he says his orchard is in such condition that the only thing he can do is to mulch, while the condition of Mr. Underwood's orchard is such that it is better for him to cultivate.

You pay your money and take your choice. If the old tree needs food for its roots, it will go twenty feet from its trunk and further to find plant food for that bearing tree, and you have got to give it moisture in some shape. Moisture is the most essential feature if the tree is to bear fruit, but at a certain time of the year we have got to take this moisture away. There is a time when the tree starts fruit buds, that is about the middle of the season, and if you give it too much moisture it will not set fruit buds. You have got to know what time your fruit tree needs moisture and what time it does not. In the spring time you get the most moisture, just at the time when the tree needs it most, when it is growing, but when July comes we ought to check it a little. Now if you cultivate your trees in July it will hurt the fruit buds. I would rather have the orchard in weeds, I would rather cultivate it again anew. In some localities where there are steep side hills and the rain washes the ground away, it is better to have some grass or let it grow to weeds before the rains come, or have a strip between the rows seeded down.

VICE-PRESIDENT'S REPORT, SIXTH CONG. DISTRICT.

FRANK MESENBURG, ST. CLOUD.

The fruit crop during the past season was not as good as it might have been, owing to the late frost and the drought in July. My strawberry crop was a failure, on account of frost and too much rain during the picking time. My plants looked fine in the spring, but the berries were of inferior quality, and the yield was light. The crop of the Stager Fruit Farm, at Sauk Rapids, was good, and above the average in both quality and quantity. Bederwood, Warfield, and Brandywine are the most satisfactory varieties of strawberries for this locality.

Raspberries were an excellent crop. The Turner appears to stand the winter better than other varieties.

Gooseberries and currants did well, and plums and crab apples nearly as good. Grapes fruited well.

Spring planted evergreens did not do well, and a great many trees died.

VICE-PRESIDENT'S REPORT, SEVENTH CONG. DIST.

J. L. ADAMS, GLENWOOD.

Small fruits and berries did as well as could be expected with the very dry weather we had here in May and June, with very little rain in July and August. The late rains helped the vines and apple trees so they are looking nicely now. Although the raspberries have not thoroughly hardened their wood, I think they will come through the winter all right. The Turner, Loudon and Older are the favorites around here, as they do not need much petting.

I have visited a number of people who are trying to raise apples around here, including Mr. Mickelson, who, I think, has the largest orchard in the county. He has over 100 trees, about fifty of which bore this year. They are looking finely. He cultivates and has a north slope on the lake shore. His favorites are the Peerless, Wealthy and Duchess, although he has a number of other kinds. One Duchess bore so heavily he had to prop up the limbs. Among others I visited, the Duchess and Wealthy were the favorite trees, although some liked Peerless, and others the Anisim, according to the nursery they bought from. But from observation and small experience, I should say the Wealthy, Duchess, Peerless, Longfield and Whitney in the order named were good enough for us.

MEETING OF THE PENINSULA HORTICULTURAL SOCIETY.

O. M. LORD, MINNESOTA CITY.

I had the pleasure of attending the fifteenth annual meeting of the Peninsula Horticultural Society, which includes Delaware, Maryland and a part of Virginia, at Berlin, Jan. 6-8. Berlin, Md., is six miles from Ocean City, on the Atlantic coast, a prominent summer resort. The railroad from Philadelphia runs nearly the whole length of Delaware, the south part of which is almost a continuous peach orchard. At Berlin is one of the largest nurseries in the district, owned by Harrison Bros., who kindly gave me a carriage ride over the grounds, the most of which are devoted to peach and pear trees.

Peaches and the Keifer pear occupied a large share of the attention of the society. The only part of the program of interest to us was the handling, the package and transportation. Greater care in handling the fruit was especially emphasized, and the universal package of five-eighths bushel baskets was shown to be, from market reports, not equal to the Georgia oblong crate. The evils of discrimination in freight rates were presented and discussed in a manner which we can duplicate at any meeting.

Strawberries are largely grown here and are a profitable crop. No profit in grapes. The whole peninsula is well adapted to sweet potatoes, and a strong impetus has been given to their culture by the Department of Agriculture in making several shipments to Europe, which brought double the price obtained at home. This fact soon drew out a spirited discussion in regard to handling the crop, and methods of storage and manner of packing for shipment, the outlook for the crop in future being very promising.

The Maryland College exhibited 150 varieties of plums, which attracted much attention, but there were only twenty plates of apples shown and a few pears. Every little town has a cannery for peaches, tomatoes, pears and corn, and the clashing of interests between growers and canners were very hard to reconcile.

The plums, which were in glass, were put up by Mr. Kerr, of Denton, who had 250 varieties at the Baltimore meeting of the state society. I spent two delightful days at Mr. Kerr's place and tasted Japan plums, chestnuts, walnuts and a great variety of fruits that I had never seen. The visit impressed me with the wonderful possibilities of fruit growing in this region, though they labor under the same difficulties that confront us with insects and fungous diseases.

SOME THOUGHTS BY AN AMATEUR ON OUTDOOR IMPROVEMENTS.

MRS. FLORENCE BARTON LORING, MINNEAPOLIS.

The mental notes from which I shall glean today cluster about the home. The house itself does not come within my province further than this—when building, one ought to consider fitness. As we all know, one style of architecture may be perfectly adapted to seashore or mountain, and be actually absurd for the purpose of a town house. An appropriate and picturesque country home may lose half its attraction on a city residence street; and in the former instance the natural surroundings, while in the latter the character of thoroughfare and size of lot, will lead to still further distinctions and modifications.

The house once decided upon, what is the first outdoor improvement to be attempted? Obviously, the planting of trees, unless happily present. As some one wittily said, "Large trees will not come to us: we must go to them—and a good way to have trees at once is to plant them a long time ago." And how frequently the early settlers abused this opportunity of having fine trees at once! Cutting down bur and scarlet oaks ruthlessly, turning beautiful oak openings into deserts, a vandalism which caused their successors many a sigh of regret. So much has been said, and is likely to be said, regarding planting, that I will only hazard a few ideas in this connection, and these from my own standpoint. A street with no vegetation on its borders, either in parking or lot, is indeed a sight for "glorious grief or solemn mirth!" But why should the ornamentation be always trees and so many of them?

Conditions vary for wide residence streets or large lot. Nothing can supplant noble trees; though, even then, to my mind, fifty feet is none too great a distance between each specimen—for experts admit both vista and sky-line are rendered equally as effective through this method as by closer planting, while we all know the value of sufficient light, air and nourishment for each tree, and the necessity of sunlight for humanity.

And, here, a side thought. Why not more diversity? A stranger would sometimes judge, trusting his eyes alone, that no tree but the elm would bear transplanting in the West! And to continue my queries, why render narrow streets or small lots, where the dwellings are crowded together brick-fashion, dark and breathless by close lines of trees? Beauty is oftentimes secured by variety, and utility as well as health is always to be considered in home environment. Then, why not, in such situations, resort to trees which never attain large growth, like the hackberry or flowering shrubs, for ornamentation? Habit alone is lacking. Once establish the custom, and lot owner, park commissioner or city authority would treat low-growing trees or effective shrubs with the same recognition that their more stately kin generally receive.

Before departing from this especial theme allow me to avow, as an amateur, my doubts regarding the advisability of trees on certain business streets, even if it were possible to create a general and imperious demand for them. With further explanation, this will not seem such rank heresy, even to the most impassioned tree lover. If the possibility of ultimate growth and importance could be surmised and seriously considered by those who plan village thoroughfares, then, indeed, might we easily have tree-bordered business streets in towns and cities. For, with avenues from 130 to 200 feet in width, room would be secured for traffic, wide footways and a parking liberal enough to produce healthy tree growth. But this ideal state of things seldom exists—and, viewing hard reality, what encouragement is given for tree planting in business sections by comparatively narrow roads, with their pavements and stone sidewalks?

And, in this connection, one is reminded of the famous "Unter den Linden," which, despite its width, disappoints most tree lovers, for it does not require a trained eye to discover these trees protest, in their dumb way, against the environment imposed upon them. And loyal Germans, incredible as it may seem, acknowledge that constant re-planting is necessary in this, their most noted avenue. It reminded me of a flower, placed in a maiden's hair, falling a

sacrifice to bedeck a beauty less perfect than its own. So much, by way of protest.

Now, a few words of admission. In a suitable climate, certain species of palms lend themselves cheerfully to the decoration of business thoroughfares, reaching great perfection with little space or care, and giving a most distinguished appearance to the section adorned by their presence. Again, in more northern climes, carefully selected indigenous shrubs would accommodate themselves to similar conditions. And, moreover, my objections cannot apply to village streets, where it is always possible to have the more thickly populated portion of such towns ennobled by large and beautiful trees; nor to the residence portion of a city, nor the suburbs of a large metropolis, as in all these instances there can be no difference of opinion. I cannot refrain from adding my grateful tribute to the influence wrought in our own city by men like Col. John H. Stevens, Capt. Ed. Murphy and the late Hon. W. S. King. These men wrought by example as well as precept, planting trees with their own hands, making various improvements and giving land; and when one's speech has a basis of deeds upon which to rely the listener is never wholly indifferent, while the most finished oratory has no lasting influence when unaccompanied by personal worth or earnest work.

"Who never doubted, never half believed: Where doubt, there truth is—'tis her shadow," yielding opportunity for any one to decide the matter according to individual preference, and such is the present situation among landscape architects regarding enclosed areas for homes. An authority recently wrote thus: "Border plantations along the street property lines tend to enclose an estate and secure a degree of privacy and seclusion, and it is probable that in the future these plantations will be more common. The openness of front yards and lawns, now so prevalent, is possibly due to the national spirit of democracy; but if so, it is paradoxical when found in a country whose people are also noted for their love of home." In my judgment the last few words stand at the parting of the ways in this discussion. Shall the town or city gain in beauty, with corresponding loss to the individual owner, or shall the general whole yield some of its present advantages, as years pass by, to the natural requirements of the home-maker? England answered this question generations ago; but the exaggeration of her reply makes few converts to division lines in our land, where inaccessible stone walls and lofty hedges find no advocates. But it is my belief that many who embrace the park system eagerly when

applied to public grounds or cemeteries are becoming dissatisfied with its too-open policy when connected with their homes. If this be so, not many years will elapse before American ingenuity will grapple with this problem, and by judicious management of light wooden, wire or iron fences, low tasteful walls or dwarf hedges, solve it—to the national satisfaction, at least; and when so-called private grounds really compass privacy, the unselfish workers for public breathing places will find support for the establishment and maintenance of public parks, squares, play grounds and similar privileges from unexpected quarters—people will be alive to those necessities who are now both dumb and blind.

An ethical question arises, also. Would not boundary lines, denoting private ownership, increase the respect of children for that ownership? Two years ago at a convention of the American Park and Outdoor Art Association, one of the most animated discussions arose anent the almost utter lack, in youthful minds, of respect for the property rights of others. There was no difference of opinion regarding the fact, but diversity as to the cause and remedies. The indulgence of American parents is doubtless one cause; the liberty, trenching upon license, accorded youth in this country, probably another. But whatever the causes, sufficient remedies are yet lacking and are to be sought eagerly.

A Hampton student, when asked, "Of what is the surface of the earth composed?" answered: "Dirt and people," which oftentimes seems a faithful description, so frequently is the former found wherever the latter inhabits. The old definition that dirt is misplaced matter being admitted, man should study how to banish it from his immediate vicinity, viewing the problem in its larger meaning, including thus garbage, weeds, the bill board and any other unsightly or disagreeable object—cremation for garbage, offal and waste of all kinds, and public opinion for bill boards.

An abundance of water is needed for utility or beauty, in city or country, and is a blessing never fully appreciated unless withheld. Woonsocket, South Dakota, affords a happy illustration of enterprise through organization. The women asked for a better water supply, the men expressing their regret at not being able to better conditions. Next, an improvement association was formed by the women, with a ready response of funds by the men. An expert was hired to drill an artesian well, resulting in a flow of water yielding a pressure of one hundred and fifty-three pounds to the square inch and giving six thousand gallons of water per minute. The town authorities availing themselves of this well, mains from it were

placed all through the town, and an artificial lake is being constructed, which will be surrounded by drives, walks and trees.

As has been well stated, "Neatness and picturesqueness, simplicity and intricacy can be compassed in a village." Natural effects of great beauty can be preserved which the crowded, strenuous life of a city would obliterate. Ravines and valleys can be rendered an added attraction in a small town by judiciously planting the sides with native trees, shrubs, plants, placing streets at the edge, on either side, and building houses facing the ravine. Too often a valley is rendered unsightly by filling it with the debris of the whole neighborhood, while all the buildings turn their backs upon it ,as if to ignore or scorn its very presence. Valleys, or basins, in parks, are but recently being rated at their true value. This method of planting, road making and house building applies equally well to a river bank, wherever manufactories or railroads do not monopolize the frontage; and even then the shore lines can be redeemed from absolute uncleanliness and ugliness by proper agitation and co-operation, as was shown by Mr. Loring last evening, in his allusion to the Northfield views. Native vines and shrubs, willows of different kinds, and the sterile variety of cottonwood, or Carolina poplar, with now and then a red cedar, are all most suitable in changing mutilated, abused river banks into a scene which could be described as "not without art, yet to nature true."

In dealing with public or private grounds, one fact most important to be kept in mind is this: Any road which is not a necessity is a positive impertinence. In cemeteries the many roads are necessary, and partially destroy the so-called park design. The loveliest roads are in the country, where only an unobtrusive ribbon of mother earth is seen, and restful grass, luscious clover, shy wild blossoms, dainty ferns, with now and then a hardy shrub or stately tree, crowd in upon the traveler as if to do him honor and express affection by their nearness. Where the demands of traffic are not too urgent, roads should be planned and made after this fashion. Another hint: We sometimes become daft over curves. One has good authority for stating that a curve in roads for the sake of avoiding a straight line, where the latter is most convenient and no obstacle exists to prevent it, is nonsensical and a violation of good taste. Obviously when we desire to avoid too many straight lines, we must provide a definite, healthy obstacle to turn the path aside.

Everything to which we have heretofore alluded could well be executed ere the house be built, and some landscape artists plead

for this privilege, advancing arguments which I have not time to repeat. But, without expert aid, think of your yard as a picture, the house forming the background, a clear lawn the center foreground, and masses of trees, shrubs and plants the frame, with broken edge.

We will now imagine the house ready for occupancy. Then plant vines! And, in this work, one rule must be remembered—conditions or individual preference will guide the rest—never allow vines or shrubs to hide the whole foundation of your home. At intervals this foundation must be allowed to prove its stability and worth, as necessary to the beauty of your home as are right principles to beauty of character.

Home and Mother Nature! In securing the one we too often sear and scar the other. But loyalty to home need not destroy fealty to nature. All true men and women love both, and will find a way finally, through increasing knowledge and endeavor, to reconcile the two—compromising, modifying, blending, until the line of demarkation, giving rise to the axiom that "God made the country, man the town," is partially obliterated, and the lofty emotions engendered by the beauties of inanimate nature will join, unimpeded, the deep affections clustering around the home, forming a perfect whole, which cannot fail to satisfy every aspiration it inspires. A perfect whole! Now despaired of by the pessimist, believed in by the optimist, dreamed of and described by the poet, seen by the pure in heart, and deserved of all mankind who labor and strive for its fulfillment.

TRAINING THE TEACHERS IN FLOWER CULTURE.—An exchange says: "To bring the country home up to the plane of the city as regards the cultivation of flowers and decorative plants is the ambition of the Illinois State Board of Education. In pursuance of this idea the board has decided to establish a new department at the State Normal University at Bloomington, which will be devoted exclusively to the purposes indicated. A greenhouse and garden spot will be laid out, all kinds of plants and flowers indigenous to Illinois will be cultivated by the students, and a competent instructor will be in charge to teach the methods of propagation and tasteful decoration and arrangement.

"It is the purpose of the board to instruct the teachers who are fitting themselves for rural teaching especially the proper care of flower gardens and of decoration of buildings and grounds. It will be the endeavor to carry on such adornment with the appliances which might be available at the small schoolhouses, but which will be sufficient to instil into the minds of the pupils the possibilities for improvement at their own homes.

"The student will be instructed in the knowledge of moisture in the soil, effects of different forms of cultivation, and will assist in the regular botanical course by practical demonstration on flowers, plants, fruits and vegetables need more than ordinary care. The results may be of far-reaching importance and justify the slight expenditure."

THE HOTBED AND ITS USES IN VEGETABLE GARDENING.

C. B. WADDELL, ST. LOUIS PARK.

The first thing to be considered is the location. A gentle slope to the south is preferable to any other, with a windbreak, either natural or artificial, on the north, east and west, but not near enough on the east or west to shade the bed at any time of the day. Very good results can be obtained from a hotbed built on level ground until the wet weather comes; then there is no chance for the surplus water to get away, the bed gets sour, and the stuff turns yellow and refuses to grow. Have the ground on which the bed is to be built free from ice or snow. If the ground is frozen, cover it with two or three inches of dry, cold horse manure. Cover this with at least a foot of warm horse manure, tread well and cover with another foot of cold horse manure. This for a bed built in the first part of February; if later in the season smaller amounts can be used, or if the bed is being built on unfrozen ground less will do. Tread the whole well so that it is quite level and no soft places. On this foundation place the frame.

The frame in most general use in our part of the country is five feet and two inches wide by sixteen feet long, outside measurement; twelve inches deep, with three pieces of 2x4, five feet two inches long and four feet apart cut into the sides until level with the top of the frame. Before fastening in those cross pieces it is well to square the frame, or the sash will not fit well. They will look like saw teeth, and there is more danger of leaving holes. Under the middle 2x4 put a piece of board five feet long, four to six inches wide edgewise, the bottom to be level with the bottom of the frame. This will greatly stiffen the frame and hold it in shape. We make the ends of this frame of two inch stuff and the sides of inch stuff.

Cover this frame with four sash four feet wide by five feet two inches long. Do not use glass larger than eight by ten inches; in large glass the breakage is much greater. Have glass bedded in putty and lapped about one-quarter of an inch. I have used sash with the glass butted. The breakage in those was much larger. The lap seems to give the glass double strength. The wooden part of the sash should be of two inch stuff. I have seen one and three-eighths inch used, but they are too light and will not stand nearly so much wind when open.

In the hotbed yard these frames may be placed in rows; about three frames, or twelve sash, is as many as can be handled conveniently in one row. Supposing this first row to be on the north side of

the yard (which is the usual way), put the second fourteen or sixteen inches south and parallel with the first. Fill this walk or space between the rows with manure dry, or frozen if you have it, anyway have the top four inches of this dry stuff. The wet manure will freeze in a foot, when if covered with dry four inches it will not freeze at all. I once tried to save labor by filling the frame with manure when I built the beds, and then take out enough to bank the walks with of the wet, hot manure. It froze to the bottom of the frame, and I had to remove it. Bank the ends of these rows well two feet or more.

In from five to seven days these beds should be hot and ready for earth. Then remove the sash and tread the manure until it is quite solid and fill the soft places. If this is well done, the earth will come off much nicer in the fall, and if the manure is level and the top of the earth level you will have it the same depth all over. Spank the loose straws down so that they will not stick up into the earth and catch into the rake. Put in six inches of earth, and when the earth is nicely warmed through, probably in one or two days, your bed is ready for plants or seeds. If it is about the first of March, and you have good plants raised in the greenhouse or earlier beds, you can have fine lettuce for market or the table in twenty-five to thirty days.

The sash should be covered with shutters on cold nights. They should be opened a little in the morning when the thermometer shows 70° to 75°, when it will probably drop back to 60° to 65°. If in the middle of the day it should go to 80° to 85° open a little more; by four o'clock if it is not above 80° it will be safe to close the sash. If the wind is freezing, open the sash on the side or end away from the wind.

A crop of radish can be raised in a bed of this kind in thirty days. Sow the seed in drills one-half an inch deep, the drills about four inches apart. It would be well to test radish seed. If it all grows a seed every one-half inch is plenty; if only fifty per cent is good sow it twice as thick. I believe that all seeds used by gardeners for forcing purposes should be tested the year before, so that you may know that they will grow and also that they are true to name. This is especially true as to lettuce and cucumbers, for fifteen cents worth of these seeds will produce $500.00 worth of vegetables, while if your seeds were not true to name you might expend the same amount of labor, the use of your sash and grow a poor crop, which would bring half price or less, and always hard to sell. April 1st is about as late as radish seed can be sown in hotbeds and get the crop to market before the outside crop gets in. But if you

have good plants you can keep putting in lettuce up to May 1st, with a good chance of marketing it in advance of outside lettuce.

About March 15th sow cucumber seed for hotbed crop. Sow the seed either broadcast or in drills, either in greenhouse or hotbed; cover with sand. They will come up quicker if you will cover with glass pressed down on the sand; remove this glass when the plants are plainly seen under it. Transplant into four-inch earthen pots or berry boxes when plants are just starting the third leaf. This will be about April 1 to 5. May 1st you will have nice plants. Remove the plants and dirt from the pots or boxes and plant them in center of sash, place having been made for them by leaving out four or six lettuce plants. I have always had the best success with both lettuce and cucumber plants when they have been kept growing right from the start. Lettuce plants I would keep at 40° if possible at night and on cloudy days, and 70° to 90° when the sun is shining. Cucumbers I like at 80° at night and 100° in the sun.

There are very successful gardeners who make and manage their hotbeds in a manner entirely different from the way I have tried to describe to you, and I never fail to gather useful information at any visit I may make to them. We are usually too busy to visit much during the hotbed season, and so lose the benefit of each other's experience. This paper just scrapes over the surface of this subject, but if what I have written proves of advantage to any of my hearers it will be some return for the kind attention you have given me.

Mr. Frank Yahnke: I would like to have the gentleman explain how he transplants cucumbers.

Mr. Waddell: Just take the plant up carefully with a stick and make a hole in your bed and stick it in; it will start right off and grow. It is no more trouble than to transplant lettuce. Another way is to lay the pot over on its side and fill it half full of dirt and then put in your plant; it is no trouble at all. I just want to say a word in regard to a statement made by the gentleman who preceded me when he said he would make a pit under his hotbed. I would not do that; it holds the water. I want the surface water to run off just as fast as possible. My idea is that that pit would hold water and cause trouble, and that is what we want to get rid of. If your hotbed were built in the sand the water might drain away, but if it is in clay I don't think it would do at all.

STRAWBERRY CULTURE ON A LARGE SCALE.

J. L. HERBST, SPARTA, WIS.

There are no new methods employed in growing strawberries in my section but what are in use in your own state. Twelve years ago there were less than ten acres of strawberries grown in the vicinity of Sparta. Five years ago there were more than 350 acres, but now there is considerably less, and the acreage is decreasing at Sparta.

In brief, I will give you an outline of how the work is carried on or, rather, was carried on at the Thayer Fruit Farms, where I have been for the past ten years.

The soil is made ready for the setting of the plants as soon as we are able to get onto the ground in the spring. It is made fine and mellow after plowing by the use of spading harrow and drag, and by planking if necessary. Some plantations are plowed in the fall and again in the spring, the main object being to get the soil in a fine, mellow condition, so that the plants can be put in the soil in proper shape. Rows are marked off both ways where plants are set by hand, but where the transplanter is used this is not necessary.

Some prefer the transplanter to hand setting, but the majority set with spade. While it takes a little longer to set by spade, still by this method each plant is set exactly the same distance apart, and cultivations can be given both ways for awhile, which saves a good deal of hoeing. Plants are set eighteen inches to two feet apart in the row, according to variety, and the rows are three and one-half feet apart. The slow growing varieties are set closer together in the rows, but those that are strong and vigorous are set further apart in the row.

Some growers set two rows of pistillates and one of staminates, while others prefer three of pistillate and one of staminate. A good plan is to set two pistillate and one staminate for ten or fifteen rows, and then set two pistillate and a different staminate for ten or fifteen more rows. If you are setting two or three acres of Warfield or any other pistillate, use different staminates to fertilize them, using early and late staminates. By this method you catch the early and late blossoms of the Warfields.

Just as soon as the setting is completed cultivation begins and is kept up at intervals throughout the season, narrowing up the cultivator as the runners increase, the object being to throw runners one way and make a matted row. Resetting is done, and runners thrown in vacant places to insure full rows. Cultivation is kept

up until frost appears, and hoeings given as the weeds appear. What blossoms appear are nipped off at this time. The beds are given their winter protection as soon as freezing begins. This consists of marsh hay, straw or any coarse litter, spread on just thickly enough to cover the leaves. This finishes the work for the first year.

The following spring as soon as the leaves begin to push up into the covering, it is removed to the space between the rows to serve as a protection to the fruit from becoming dirty and to act as a mulch. No cultivation is given the second year. This year comes the harvesting and disposing of the crop. I consider this the most important part of the business, and for the grower to harvest his crop and dispose of it in the way it should be done he must know his business. There was a time when strawberries of any kind, good, poor and indifferent, could be placed upon the market in any shape and bring a good price. But that time has passed, and the grower now in order to command a good price and find ready sales must send out only fruit of good quality, size and color, put up in neat and attractive shape. Did you ever put up nice large, highly colored strawberries in dirty, broken boxes and crates and then put the same kind of fruit in clean and well made packages and see which sold the first and brought the highest price. Growers at Sparta have found this out and never use boxes the second time.

There are different methods used by which the crop is harvested, but I shall give you the one I am best acquainted with. The pickers are mostly women and girls. Boys are too talkative and get lame in the back too quick. Pickers must agree to stay throughout the picking season or forfeit a quarter of a cent on each box picked. In other words they are paid one and one-fourth cents per quart for picking, and if they have been faithful and remained throughout the season they are paid the other one-fourth of a cent at the end of the season. Each picker is numbered and holds this number throughout the season; the crate she picks in has the same number, so that wherever you find a number "27" crate the picker of it is also number "27." One reason for this system is this. Whenever No. "27" has her crate full she calls her number. A tender gets her crate, gives her a check for it, and brings it to one of the tables, that stands in the field. At each table is a girl whose business it is to put the fruit in crates, and to see that all berries are picked properly and boxes filled. If, in doing this, she finds No. "27's" berries are too green or mashed, or boxes not filled (of course we never get them too full), this is reported to the foreman of the pickers, and as he has a list of all pickers and their number he is able to know just who it is and can remedy the trouble.

Pickers are not allowed to carry on any unnecessary conversations; tenders are not allowed to converse with pickers—the foreman does all talking.

As soon as the berries are crated they are hauled to the packing shed, where, after another party has inspected them, they are covered and taken to the shipping point, either to express or refrigerator cars, as the case may be. A grower who knows his business will get his fruit on the way to its destination as soon as possible after being picked.

In brief I have given you the methods I am acquainted with in growing strawberries on a large scale. The methods are the same as those used on small acreages.

Mr. Oliver Gibbs: For many years Wisconsin has had the record for the largest growth of strawberries to the acre, the largest crop having been produced by the late J. M. Smith, at Green Bay, Wis., on a quarter of an acre, yielding at the rate of 600 bushels to the acre. Parker Earle, of Illinois, was crowned the strawberry king of the United States, I think of the world, he having grown them for market to the extent of eighty acres. Parker Earle, I think, had to lay aside that crown and has retired, and now as our president has given our Wisconsin friend the record of being one of the largest strawberry growers in the United States I would like to ask him how many acres he is growing.

Mr. Herbst: Twenty-eight acres is the most I ever had. I explained when I came on the stand that I was not the largest grower.

Mr. Cashman: I would like to ask Mr. Herbst whether he finds spring plowing the proper way to prepare the ground for planting strawberries, or whether it would be better to plow early in the fall to pack the ground and hold the moisture?

Mr. Herbst: I plow in the fall and then again in the spring. I have the land plowed in the fall and then in the spring use the spading harrow and the drag. We have used both methods but found that beds will pack, and the land should be replowed in the spring.

Mr. Wedge: Your soil is pretty sandy, is it not?

Mr. Herbst: I have both light and heavy soil and some loam.

Mr. McColly: What do you consider an average crop?

Mr. Herbst: One hundred and twenty-five bushels. I have got more than that, but they will average that amount—250 cases.

Mr. McColly: What has been your largest yield?

Mr. Herbst: I think 250 bushels. This same gentleman, Mr. Smith, raised on a quarter of an acre an amount that would figure up 600 bushels to the acre. You can get more berries from a quarter of an acre than you can from ten acres in proportion.

Mr. McColly: I understood the writer of the paper to say that there are not so many strawberries raised in his vicinity as there were formerly.

Mr. Herbst: There are several enterprises going in there, and as many strawberry growers are quite a distance from a shipping

point they have abandoned fruit growing for something else.

Mr. McColly: Do they think it has become less profitable?

Mr. Herbst: No, but they think some other business would be more profitable situated as they are.

Mr. Taylor: Do you practice irrigation?

Mr. Herbst: No, sir; we do not.

Mr. A. K. Bush: Do you find less trouble with cutworms and white grubs in fall than in spring plowing?

Mr. Herbst: I do not know that much can be saved by plowing in the fall.

Mr. McColly: How often do you cultivate in the summer?

Mr. Herbst: Sometimes twice a week, sometimes once. We always cultivate immediately after a rain.

Mr. McColly: Do you ever use a weeder?

Mr. Herbst: We used the Breed's Weeder one year, but did not like it.

Mr. McColly: Would you not get better results by taking the covering off from the strawberries until they color and laying it up between the rows?

Mr. Herbst: Do you mean take it off and then put it on again?

Mr. McColly: Yes, sir.

Mr. Herbst: I think for the results you would obtain it would not pay you to do it.

Mr. Colly: Is it not a fact that the ground will be hard and the vines will not produce so well?

Mr. Herbst: That might be true on clay soil.

Mr. R. A. Wright: I have never found ground that is mulched becomes hard.

Mr. R. H. L. Jewett: Don't you find it to be the case that along the row next to your mulch you have the best berries?

Mr. Herbst: Yes, sir.

Mr. Jewett: Is that not an argument in favor of mulch being as good as cultivation?

Mr. Herbst: I should think so. It was stated a while ago that larger berries were found on the outside than in the center of the row. The plants are not so thick there.

Mr. Clarence Wedge: What do you think of irrigation?

Mr. Herbst: I saw it practiced only once.

Mr. Wedge: I understood there was a man at Sparta who had an irrigating plant.

Mr. Herbst: He used it only once and never had any use for it after that.

Mr. A. J. Philips (Wis.): They were irrigating a plantation at Angelo one year. They had an artesian well. I did not know but what you might be familiar with the results.

Mr. Herbst: I do not remember of hearing of any great results from irrigation. There was an irrigating plant put in there one year, but they never had an occasion to use it.

Mr. Wedge: There was a question of what you did with poor pickers?

Mr. Herbst: Fire them, let them go.

Mr. T. E. Cashman: I want to say a word about irrigation. A year ago we had a dry seasan at Owatonna that crippled our fruit except where we irrigated. Our field happened to be near the water-works fountain, and I kept two strings of hose running on this patch for two or three weeks. I must say the result was wonderful. It paid me well. If I were to go into the business extensively I would not want my plant situated anywhere but where I could irrigate. I found that those who did not have a chance to irrigate did not have any crop, while I had a big crop.

Mr. O. W. Moore: I had something a little new that occurred to me in strawberry culture the past season. I set out a small bed of two or three hundred plants. The weather came on very hot and dry in May. The truth of the matter is I went away fishing, and when I came home the larger part of my strawberry plants were dead, and all I saved was about fifty plants. I went to work nursing them and saved them. I had heard about a theory or practice of setting strawberry plants in the fall, and about the middle of October I tried a little experiment. I took up plants in the row and set them in the vacant places six inches apart clear through. I filled up the rows all the way through, not knowing whether they would grow or not, but it was wet, moist weather, raining two or three days in the week; and the result was I did not lose a single plant, and at covering time they were all alive and had done well. What the result will be next spring time will determine, but in a favorable season the rows can be filled out, and the plants will live.

THE BLACKBERRY FIELD AS A BUSINESS VENTURE.

WM. SANDROCK, RUSHFORD.

My experience with blackberries dates back to 1875. For the first five or six years it consisted of setting out a good hardy variety and grubbing out one *that was hardy* the year before, until I got the Snyder.

In 1880 I had my first blackberries for market, the whole crop (2 rows, 16 rods long) amounting to about 40 16-quart crates. The next year I had only thirty cases on four rows, sixteen rods long. The winter of 1880-81 seemed to be hard on the canes. I then tried laying them down for four successive years with good results.

In 1886 I laid down only part of them in the fall, and found, to my surprise, that those left standing yielded the best. So I have not laid down or covered any blackberries since, and have had berries every year. To my belief, blackberries do not winter-kill but summer-kill. I have always found ready sale for all the blackberries I raised, on about one and one-quarter acres, in home market at from six to fifteen cents per quart.

I would say as a business venture that it is a good investment. Not much capital is needed if you have the right kind of soil and location; and you can easily ship them 500 miles if you don't find a nearer market.

Plant on high ground, rows running north and south, twelve feet apart, and plants two and one-half feet apart. You can plant corn and potatoes between rows the first year, and beans the second year. If you have given good cultivation both years, they will not need any more cultivation for at least five years, as too much cultivation cuts the roots and throws up too many suckers instead. Seed the ground to clover and cut the same when in bloom and use for mulching plants. You will find twelve feet none too far apart for the rows if you have them on good clay loam. If they look too far apart, give them a good coat of stable manure, and you will find them close enough the following year.

I have four kinds of blackberries but raise only one kind for market, known as the Snyder. I consider it the best, for two reasons. It is both early and hardy, and you can get most of the crop sold before other varieties, also apples, are ripe. They also bring a better price than the later kinds.

Two hundred 16-quart crates is a good yield per acre. I pay 1¼ cents per quart for picking, besides about ¼ cent per quart for other expenses. You will not need as many boxes and crates by selling in home market, as crates can be used several years and boxes refilled three and four times during a season, if they are returned. For the last ten years blackberries have brought an average of ten cents per quart.

AN ENEMY TO THE SAN JOSE SCALE.—The secretary does not vouch for this, which was clipped from an "exchange":

"There is in China a lady bird beetle, which is death to the San Jose scale, and grows fat on it. This insect is to be brought to the United States and propagated by the department for use in the several states where the scale is a nuisance. It has been discovered that the ancestral home of the scale is on the sunny slopes south of the great Chinese wall. It is here, also, that the lady bird beetle is found. So voracious is this beetle that in China the scale does little or no damage to fruit trees."

AN IDEAL PUBLIC PARK.

FRED NUSSBAUMER, SUPT. OF PARKS, ST. PAUL.

In the course of the following short notes it is intended to emphasize the principles of a public recreation ground for the masses, no "keep off the grass" signs or other restraining rules to be enforced except as pertaining to good order. An ideal park must always be kept clean, neat and tidy; a dignified appearance of the grounds will invariably appeal to human sense for respect, and appeal to its appreciation for preservation of the beautiful.

As to the planting of parks, while it is not intended to give a list of the trees and shrubs suitable for the purpose, it will be proper to impress upon the minds of the planters that the most successful results, both as to beauty and economy, can be produced by the use of our native trees, shrubs and vines, and why? Simply because they are in harmony with our climate, with the hue and tint of our clouds and sky line, and nature helps to supply its elements. This is the reason why we cannot delight in exotic outdoor embellishment of our pleasure grounds.

Parks or gardens were established in early times. We find in Yager's "Gartenkuanrst and Gaerten" a description of the gardens of the Romans. In Gibbons' "Decline and Fall of the Roman Empire" we find how in the sixth century B. C. the troops of Belisarius entered Grasse, where they found a palace of a vandal king surrounded by villas and gardens which Procopius describes as Paradise, but in those mediæval times their extent was limited to walled enclosures, necessitated by constant hatred during these unsettled centuries and until civilization took a foothold among the peoples.

The infancy of civilization was cradled in cities. In the earlier ages they were built with walls around them for defense against their foes in the frequently recurring wars of those periods of civil strife. The walls remained long after settled governments had brought internal peace and order to the nations. The populations, crowded in narrow and dirty streets in the narrow circuit of their walls, without sewers or supplies of pure water, or open spaces for the play of fresh air, were subject to annual devastations by diseases and plagues unknown to civilized countries in modern times, at least since Cuba was purged of the Spanish poison. To escape the filth and pestilential odors of the cities their wealthier people moved outside of the walled inclosure, where they could enjoy the pure air and the beauty of fields and gardens, and live in health amid the refreshing influences of rural scenery. These

extra-mural suburbs became the favorite residences of the well-to-do, and it was the picturesque grounds of the private estates of the rich which gave the first impulse to the creation of parks for the common people in recognition of their common right to the enjoyment of God's pure air and the beauties of nature. To-day there is not a city or government that does not fully comprehend the importance and value of public parks for its citizens, not only by increased tax returns, but chiefly by their benefits in ministering to the health and pleasure of the masses, who cannot afford the expensive outings of the rich. They are a necessary part of the comforts and health-giving recreations of modern city life.

The definition of "an ideal public park" will unavoidably differ as men's minds differ. An occasional visitor to the park finds an object or a series of objects ideal, when a habitual visitor goes by without noticing anything in particular; others comprehend what was aimed to be accomplished in landscape effects, and are more apt to have a true appreciation of its work and character. A region containing a large enough area to combine most all the essential features desirable in rural scenery, of undulating surface, meandered by lake or stream, winding valleys, growth of natural woods and open spaces for greensward, would be an ideal tract for a park. Lines of needed drives and walks adapted to curves of the natural surface, trees and shrubs to be kept in harmony with the natural character of the site, and nowhere a manifest desire to obtrude the artificial work of the landscape architect in place of nature's teaching, will give the highest impression of a correct rural or ideal park, distinctly adapted to stimulate a poetic sensibility, in the enjoyment of nature and its soothing, tranquilizing charms of sympathetic mystery, grandeur and sublimity.

But this higher example of landscape art does not appeal to the sensibilities of the masses who resort to the parks. While they enjoy pure air and find pleasure in exercise, many of them do not comprehend the elements of beauty in landscape, or the potent charms of rural scenery. For this reason (and because it would be difficult to obtain a tract of ground close to the city comprising all the requirements for an ideal park) it is that human handiwork and ingenuity are employed to unite essential elements of natural beauty in harmony with the subordinating elements existing or which of necessity must be introduced for the accommodation of visitors, such as shelter buildings, refectories, suitable buildings for public convenience, music pavilion, accommodations for picnic grounds, drinking fountains and settees, and boat houses to accom-

modate boating on park waters. A successful or ideal park must provide facilities for recreation and, to a certain degree, objects of attractiveness in horticultural displays—especially so in the high northern latitudes where, on account of the long, bleak winters, the floral decorations in public parks excite special admiration during the short summer season—and if judiciously located within properly circumscribed limits in any park they will not be in conflict with any landscape scenery, or with the general character of naturalness in the park except as to strict rurality. The great mass of the people enjoy flowers. They also pay for the parks. While the chief and all-predominating feature of an ideal park lies in its recreative qualities, let no confusion occur. Attractions introduced for a special purpose of drawing a crowd are foreign to the meaning and intent of true park management. Nothing should be introduced, and nothing permitted, which would have a tendency to lessen its value and usefulness as a recreation ground for all classes of people; a safe and decorous place, within easy reach of the people, of a city by trolley car, at reasonable rates of fare, or other modes of conveyance, where families with children, sick or convalescent persons, the nature-loving enthusiast and the frugal workman alike may find a visit to it refreshing, restful, profitable and beneficial to soul and body.

ENCOURAGING EXPERIENCE IN TOP-WORKING THE APPLE.

F. W. KIMBALL, AUSTIN.

My attention, I think, was first called to the utility of top-working by the writings of Edson Gaylord, of Nora Springs, Iowa, and of J. V. Cotta, of Nursery, Ill. Later correspondence with them, and especially with Mr. Gaylord, aroused an interest which has not abated one whit, but which has constantly increased. Upon the invitation of Mr. Gaylord I spent two days with him, and he drove me about the country, showing trees of seemingly tender varieties, long in bearing, which were strong and healthy when top-worked on hardy stocks, and in which it was hard to detect the point of union, so perfect had been the growth.

I think it was a matter of good fortune, rather than any general foresight, which impelled the selection, in most instances, of the Duchess for the stock. It was at a time when people began to think that most any kinds could be grown, when reliable nurserymen like A. W. Sias, of Rochester, and P. A. Jewell, of Lake City, and many others, were recommending and sending out varieties

which today would not be countenanced. Mr. Gaylord, I think, and some of his neighbors, wanted a short cut to the old varieties, and the Duchess, having been so generally set, was largely used; and it is today, in my opinion, except for one defect, about as good a tree as there is for that purpose. That defect is its liability to split down, the union of limb and trunk being poor. For my top-working I selected the Hibernal and Virginia, but from now out I am inclined to favor the Hibernal to the exclusion of any other kind that I am acquainted with, though there are probably others just as good.

I prefer to set out three or four year old trees, and let them grow one year in the orchard, then graft or bud them; and in doing this I go well out on the limbs, putting in, according to the head of the tree, four to seven or eight scions. Mr. Cotta went as far as a nurseryman could well go, i. e., he grafted the single stock or whip of a young tree and sent it out after one or two years' growth. I purchased some. He at one time used the Virginia for that purpose, but later discarded it for the Shield's crab, which he considered superior, claiming that the liability of the Virginia to bark blight made it at times unsatisfactory.

Mr. Gaylord called my attention to the fact that it was desirable to go well out on the limbs to graft, and for this I thank him much, and am glad to be able to express those thanks before so large an audience, for though I cannot quite endorse all of Mr. Gaylord's theories, or go to the extent he does in top-working, yet I personally know of no one layman who, by original thought and investigation, has done more to help the cause, nor who is more persistent and unselfish.

Mr. Gaylord's warning caused me to investigate to some extent the weak spots of our apple trees which might be called second hardy, and I began to realize that the failure in many instances commenced in the forks. You watch a Wealthy that has fruited heavily for a few years, and likely you will find decay of bark in the fork; a year or two later the bark is gone, and the wood dry and hard, and if hard winters follow the tree is probably gone. Again, the year following may not be fruitful, the winters favorable, and the bark may re-form, but the injury is there. This is the good and sufficient reason for going out on the limbs. Get your trunk and all possible of the main crotches of the hardiest possible kind. The reason I select the Hibernal is:

First—I consider it one of the hardiest of apple trees.

Second—It has a strong collar, and is not liable to break down.

Third—It is not so rampant as the Virginia, and if the scions are neglected for a few days it is not so likely to smother them by suckers.

An ideal tree would be to take a Hibernal well on to its fruiting period, and, go out on the limbs and put scions all over it using perhaps one to two hundred scions; but this would be too long and tedious a job, and not practicable except on a small scale. I would not advise any considerable amount of grafting where limbs larger than an inch in diameter had to be grafted, and prefer to take them not much larger than a good-sized penholder, and either use a whip or side graft. I frequently put in a side graft on the trunk of the tree to balance it up.

Now, who should graft, and what kinds? Only those should graft who are interested so they will follow it up for the next three months and see that the scions are not being starved to death by the side shoots or suckers starting out and monopolizing all the sap.

As to kinds: Take desirable kinds that can be classed as half or second and third hardy, and I am sure you will not be disappointed. In enumerating part of the kinds I have growing, I would say that they all passed through the hard winter of 1898-9, and with comparatively little damage, though up to that time they had not fruited to any extent, the Longfield being the only one that had fruited, except an occasional apple. Had they been older and borne a heavy crop in 1898, I should probably be singing quite a different tune, yet I feel that quite a goodly per cent would have survived and rendered a good account. I mention a few varieties I am trying, but the names of many I cannot recall, except to take a stroll through the orchard to refresh the memory, and I am too far away from home at the time of writing to do that.

I wish to say that I have as trying a location as can well be found, and in case of failure or partial failure it should not discourage others. I have a clay top soil of from one to four feet, and have sand and gravel underneath. Some of my trees are set down in the pure sand, making it extremely trying during such a season as the past. Among those I have are the Wealthy, Longfield, Tallman Sweet, Grimes' Golden, Jonathan, Brett No. 1, Catherine, Northwestern Greening, Gilbert, Allen's Choice, Newell's Winter, Plumb's Cider, Malinda, Baldwin, Rhode Island Greening, Fameuse, Ben Davis, McIntosh Red, Jacobs Sweet, etc. While the action of one or two trees is not sufficient to form judgment, I would say that the tree that seemed to suffer the most

was that delightful eating apple, Grimes' Golden. Yet I would advise any one willing to experiment to try at least one, for while the tree showed some injury to limbs it started out vigorously with the coming of spring, and is seemingly a strong tree today.

I would like to say that of the many trees grafted in the spring of 1896 there are today few unions that can be detected except by the closest scrutiny. I also wish to call attention to the early bearing of the grafted trees, as well as the superior size of the fruit. Longfield budded in fall of 1894 and set in orchard in spring of 1895 have borne more barrels of fruit than Longfield on original root set in 1893 have borne bushels, and I might almost say pecks, and the size of the budded and grafted fruit is at least fifty per cent larger. Malinda, which on its own root is considered a tardy bearer, has commenced to bear with me the third season after scions were set. I believe that it is a well-established fact that top-working increases hardiness or puts it in better form to withstand vigorous winters, and largely increases size and fruitfulness. I would be pleased to answer any questions.

Weeding Onions.—I take a 9-ft. Hallock weeder and with four or five men to pull it run over twice. It kills the first crop of weeds, and very few of the onions. It saves a great deal of work.—C. A. S., in Orange Judd Farmer.

Plant Lice on Cabbage.—These insects can be destroyed by early spraying with the kerosene emulsion, diluted 10 to 12 times. The spray should be so directed as to cover the under surface of the leaves. Several sprayings will be necessary.

To Label Trees.—Zinc labels are lasting and easily made. To mark them use 1 dr. verdigris, 1 dr. muriate of ammonia, ½ dr. lampblack, 2 oz. water, mixed well in a mortar, adding the water gradually. Write on the zinc with a quill or composition pen and expose to the sun till dry.

Pot Mignonette.—This plant is always acceptable but never more so than in the winter or spring months, when it cannot be grown out of doors. It may be had in the house by sowing a few seeds in July and again in August in six-inch pots and allowing three plants for each pot. The plants must be kept growing, but in a cool location, as too much heat checks the development of flower spikes.

Secretary's Corner.

SEND IN A NEW MEMBER—before April 1st!

A HORTICULTURAL MUSEUM AT PULLMAN, WASH.—In connection with the short course in horticulture, Professor Fletcher is trying to build up a horticultural museum, in which will be exhibited specimens to illustrate pruning, grafting, budding, insects and diseases of orchards, spraying appliances, etc., in fact, everything in connection with the management of orchards.

THE NEW STATE ENTOMOLOGIST.—Prof. F. L. Washburn, from the Oregon Agricultural College, has been appointed professor of Entomology in the Minnesota College of Agriculture as successor of the lamented Prof. Otto Lugger. Ex-officio he is also "State Entomologist." The board has taken ample time in making a selection, and we are assured it is a good one.

PLANT PREMIUMS FOR RENEWALS.—All renewals of membership in this society to be entitled to plant premiums must be made prior to April 1st. Each member who desires them, when sending $1.00, the annual fee for 1902, may select two premiums of plants from a list to be found on the inside page of the front cover of this magazine. Please give this immediate attention!

OUR ANNUAL MEMBERSHIP ROLL.—As this is written the annual roll for the current year stands at 797 as against 609 at the same date last year. Have you sent in a new member for this year? And have you made good use of the 1901 HORTICULTURISTS and the society folders sent you by the secretary? We want the roll to reach 1,200 this year, and it can easily *with your help*.

THE MANITOBA SOCIETY IN SESSION.—This society, termed the Western Horticultural Society, was in annual session in Winnipeg February 21st. Unfortunately no arrangement could be made this year for a delegate there, but we were with them there most heartily in spirit. We hope another year to exchange delegates again. The society holds an interesting session of a single day.

MORE APPLES FROM RUSSIA.—Prof. N. E. Hansen of the South Dakota Agricultural Experiment Station, in a recent letter says that he has "just received a small consignment of eleven kinds of apples from Russia; some of them new Russian apple and Siberian crab crosses." Minnesota horticulturists are equally interested with those of our sister state in the outcome of this new importation.

RAISING ORANGES UNDER DIFFICULTY.—A Minnesotan just back from Florida says: "You might raise oranges here as well as there, judging by the care taken. Where they are trying to save their groves, they set the trees out and put a cotton tent around them and then put an oil stove in the tent. I don't know but what an orange grove might be tried in Minneapolis under such conditions."

A NEW BUILDING FOR HORTICULTURE AT THE IOWA COLLEGE.—The writer has been honored with a formal invitation to the opening of the new laboratory building connected with the department of horticulture at the Iowa State College. Minnesota horticulturists congratulate their Iowa friends on this addition to an already excellent equipment in our line of work. With the three capable young men who are connected with that department, valuable results are certainly to be expected.

MINNESOTA AT THE WISCONSIN HORTICULTURAL MEETING.—Besides Mr. Wyman Elliot, the regularly appointed delegate from this society, Oliver Gibbs and A. W. Latham attended the annual meeting of the Wisconsin society, held in Madison, Wis., February 3-6. There was a good attendance and an excellent program. The writer appreciated the opportunity of meeting a number of very pleasant acquaintances. A report of the meeting will appear from the pen of Mr. Elliot in our monthly.

HORTICULTURE AT THE ST. LOUIS EXPOSITION.—The pomological exhibition at the coming exposition in St. Louis will occupy a part of the agricultural building, which is reputed to be larger than any other building ever yet constructed, holding within its walls approximately 36 acres of ground. The plans, as formulated, according to a personal statement from the superintendent of building, Mr. F. W. Taylor, give to horticulture a portion of the building extending across from side to side, of such width as the interest may demand. This will probably prove a very satisfactory arrangement.

A LOCAL SOCIETY AT MADISON.—Mr. O. M. Lord, of Minnesota City, assisted by Prof. L. C. Johonnot, of the Farmers' Institute Corps, met with a number of citizens of Madison, in western Minnesota, on the evening of February 14th, to assist in organizing a local Horticultural Improvement Society. An interesting meeting was followed by a signing of a proposed constitution, in which about twenty-five participated. The organization is to be completed at an early date. There is room for such a society, combining horticulture and general improvement, in every neighborhood in the state.

A WORD FROM MANITOBA.—"We are having a queer winter here, no snow but fine sunshiny weather, which as a fruit grower here I have learned to dread; but we hope for the best. We have been fighting off partridges from our apple trees for the past month. A flock will alight on an apple tree and in ten minutes it is stripped of every bud in sight. Our apple crop was good last year, between twenty-five and thirty bushels were gathered; about the same quantity of crab apples and plums. Small fruit only fair."

A. P. STEVENSON, Nelson.

FRUIT OF MANITOBA PRODUCTION.—At the Industrial Exposition, held in Winnipeg last fall there was an unexpected display of fruit, speaking of which the president of the Western Horticultural Society says: "There were forty-seven exhibits of standard apples, eight of hybrids, and eighteen crabs, besides a large number of seedling and other plums. The exhibition excited very general interest, and the advertisement thus given to the fact that apples and plums can be successfully grown in Manitoba cannot fail to do good. The samples shown included summer, fall and winter varieties, and were of such excellence as might have done honor to any of the recognized apple growing countries." This list included thirty-three different varieties of apples and twenty-six of crabs and hybrids.

A HORTICULTURAL CLASS BULLETIN.—Prof. Samuel B. Green, horticulturist at the Minnesota Agricultural Experiment Station, is the author of Class Bulletin No. 12, just issued for the use of his classes in greenhouse laboratory work, which contains much material of special value to all practical horticulturists. Some of the subjects treated with illustrations are, pollination of plants, growing plants from cuttings, grafting, budding, seed testing, packing trees, etc., for shipment, pruning and winter protection. A copy can be had postpaid by addressing the author at St. Anthony Park, enclosing 10 cents.

ORIGIN OF STEWART'S SEEDLING CURRANT.—In a recent letter from Amasa Stewart, the originator of the above variety of currant, now living at Lamarque, Tex., he speaks of its origin as follows:

"I planted the seed of a White Grape currant, in LeSueur county, in 1858, that was grown by the side of the Cherry, White Dutch and Red Dutch currants, that produced the Stewart's seedling.

"You can see the marks of the White Grape on it and also notice the resemblance between it and the Cherry currant."

FROST PROOF STRAWBERRIES.—Reporting on a series of experiments conducted to ascertain the comparative frost resisting properties of different varieties of strawberries, the Montana experiment says: "In the varieties which were most damaged by frost the seeds were most exposed to the surface; in the varieties that suffered least the seeds were least exposed; and the gradations of seed exposure and consequent injury were plainly marked.

"Nine varieties of strawberries experimented with, the Bissel, Crescent, General Putnam, Princeton Chief, Parker Earle, Robinson, Stevens, Shuster Gem and Warfield, all of which have the seeds deeply embedded in the pulp, escaped injury altogether. Varieties with short fruit stalks and long leaf stalks, it is also noted incidentally, are less liable to injury from late spring frosts, from the fact that their flowers are to some extent protected by the foliage."

HAVE YOU PLANTED THE COMPASS CHERRY?—Although the title applied to this fruit is evidently a misnomer, as it is not really a cherry but rather a hybrid, being a cross between the common wild sand cherry and the Miner plum, it is in reality a very desirable kind of fruit as well as a highly ornamental tree in leaf, bloom and manner of growth. A single tree upon the lawn makes a beautiful sight, and a group of them should look charming. It is so well thought of also as a market fruit that some are putting them out by the hundreds, and no fruit garden may be considered complete without it. We note that a number of nurserymen now advertise it in their lists, and as it has been generally planted for a number of years now and propagates very readily, it ought to be easy to find it on sale in any desirable quantity. Don't fail to include one or more trees of this fruit in your spring planting.

A BUCKTHORN HEDGE.
AT THE MINNESOTA EXPERIMENT STATION, ST. ANTHONY PARK.

THE MINNESOTA HORTICULTURIST.

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A BUCKTHORN HEDGE AT THE MINNESOTA AGRICULTURAL EXPERIMENT STATION.

(See Frontispiece.)

The frontispiece shows a buckthorn hedge on the grounds of the Experiment Station, as it appeared in September, 1901. Against the end of the building is a vine of the Ampelopsis veitchi, commonly called Boston, or Japanese, ivy. This plant is not quite hardy enough for Minnesota winters, but does finely in the summer. I think, however, as the roots get older that we shall find it will do much better. We have made a practice of protecting this each winter by setting up some poles in front of it and covering it with straw. —Samuel B. Green.

VARIETIES AND CULTURE OF CHERRIES IN THE ORCHARD.

FRANK YAHNKE, WINONA.

I do not know if I can interest this meeting for five minutes on this subject, because so little attention has been given to this delicious fruit, the reason for which I do not know. This society has not yet cherries on its fruit list, and it has been only a few years since the Wisconsin Horticultural Society had them on its fruit list.

When I first came to Minnesota and found cherries such a luxury and so expensive that only wealthy people could afford to buy them, I often wished for a cherry orchard like my father's, for then my fortune would be made. My greatest desire was to get such varieties as I used to eat when a boy and which I remember tasted very delicious to me. But I will say right here that I have never succeeded—probably my change in taste accounts for this.

In 1874 I planted a dozen of English Morello. In the spring of 1875 I planted some of the Strauss Weichsel and some of the Homer cherries, as they are called by us. The English Morello all died out in 1885 from the effect of the severe winter. I was not satisfied with these, for they did not come up to my ideal. When

Prof. Budd, of Ames, Iowa, recommended the Russian cherry to this country, I secured from him such varieties as I thought came nearest my ideal. These varieties were the following: Bessarabian, Sklanka, Griotte Precoce, King's Morello, 27 Orel and Strauss Weichsel. The Ostheim I received direct from Germany.

Now I will tell you of my experience with these varieties and how I value them by the number I planted of each in my orchard.

Bessarabian: 4 trees. Late cherry, tree hardy, a rapid grower, fruit large and late, but the tree is a rather shy bearer.

Sklanka: 12 trees. One of the best Russian cherries, early and large; ripened this year June 20th, a good bearer.

Griotte precoce: 3 trees, not hardy and goes into the brush pile next spring.

King's Morello: 12 trees. A good tree, cherry light colored; ripened this year June 16th.

27 Orel: 3 trees. Shy bearer, cherry late.

Strauss Weichsel: 25 trees. A hardy, upright growing tree; when it first begins to bear the fruit is small, but as it grows older the fruit increases in size, quality and quantity.

Ostheim: 5 trees. A good cherry, but not always sure of a crop.

Homer: over 400 trees. A hardy tree, ripens its wood earlier in the fall than any of the Russian varieties; a good late cherry, for canning and market, and always sure of a crop; ripens when other cherries are gone and when people want cherries, and so always brings a good price.

The choice of varieties suitable to the locality is very essential in the planting of an orchard. When there is danger of root-killing the trees must be on their own roots or grafted on hardy stock. One great drawback in cherry culture is that we have no hardy stock, for most of our cherry trees are grafted on Mahaleb stock, which is not hardy enough for Minnesota. One Wisconsin nurseryman recommends grafting on the so-called non-sprouting stock, and to plant deep to prevent root-killing, but this gentleman fails to tell us how deep to plant the trees. My experience has taught me that they must be planted three feet deeper than the terminal bud on the top branch, or else they will kill. If the tree has any chance of growth or has any life at all, it must get roots from the scions. This same gentleman claims that if they sprout from the roots there will be a cherry thicket, and he has never seen a good crop on a cherry thicket. The latter might be true, but who has ever seen a good crop of red raspberries or blackberries where they

have been left without any care, and who will give up raising them on account of root-sprouting? Root-sprouting should not be the reason why we graft on tender stock, but as long as we have no hardy stock I would rather plant hardy sprouts or grafts and bud on hardy sprouts than on tender stock. The greatest effort ought to be made to get hardy stock for grafting upon.

In planting a cherry orchard it is not advisable to plant a few trees, except on small village lots where the birds are not so bad. On the farm it is best to plant a sufficient number so that the birds can have all they want without shortening the crop too much for the farmer.

I have planted the trees in one part of my orchard ten feet apart, and the rows thirty-two feet apart, and then grow currants between the rows. In the other part I planted the trees ten feet apart, and the rows twenty feet apart.

The pruning of young cherry trees is very important. All branches which have a tendency to cross one another ought to be cut off when young. Always have in view to obtain an open head, so that the sun may penetrate through it—and it will also be more convenient for spraying. When the trees become old, very little pruning is necessary.

As long as the trees are young, they need a thorough cultivation all through the season. But when the trees become old enough to bear, cultivation must cease in June. The purpose of this is to check the growth, so that they may set blossom buds. Buckwheat may be sown between the trees as a cover crop. In some cases it is well to seed the orchard down, but it must be plowed up again after a few years.

Mr. Philips (Wis.): Do you know what the Homer is? Is it an early or a late Richmond?

Mr. Yahnke: It is not either one.

Mr. Philips: How do they place it?

Mr. Yahnke: That is more than I can tell you, but I can tell you something about it. There is an opinion that it originated the cherry. You probably heard of the type of Mr. Freeman, a type of the Morello cherry that brought in such a big crop. It is the same cherry. It is claimed that is the only true Morello cherry. I claim just the opposite. I claim that is an English cherry, and this is different. I sent some cherries to a brother in Iowa a year ago last season, and he thought it was a cross between the Morello and the Kentish. It is a distinct cherry from all others that I know. You can get them ripe all at once, and you can pick them all at once, but it will root sprout and be a cherry thicket after a while.

Mr. Brand: This cherry that is called the Homer was received forty-four or forty-five years ago by mail from the state of Ohio,

six little sprouts, and the people who got them got them into bearing in three years, and as they propagated readily from sprouts the man soon had a large orchard of them, and in a single year he sold 233 bushels of fruit.

Mr. Gibbs: How do you get rid of the sprouts?

Mr. Brand: They have got to be treated just like weeds. If you keep them cleaned out from the start you will never have any trouble. Always cut them down in August. Just take a scythe and mow them down.

Mr. Fink: What do you think about the Bessarabian?

Mr. Yahnke: It is a good cherry, a late but shy bearer.

Mr. Wedge: I can say a word about it. The reason it is a shy bearer is because its fruit buds are very tender. A very ordinary degree of cold will kill them, while the tree itself is very hardy.

REPORT OF EXCELSIOR TRIAL STATION FOR 1901.

A. B. LYMAN, EXCELSIOR.

The apple crop although not as large as usual was a very profitable one, because of the high prices prevailing. Duchess, Hibernal, Patten's Greening and others averaging about $4.50 per barrel. Our Transcendent crabs bore a small crop and sold for fair prices, while the later crabs, like our Prolific, sold at $6.00 per barrel. This last named variety is marketed the latter part of September.

Apple trees in the trial orchard, received in the early nineties, were well loaded with fruits; three trees labeled "Aromatinoe" were laden with fruits of a peculiar waxen color. If this variety continues to do as well as it has in our trial orchard it is a valuable early apple. Another variety received the same time is the Lowland Raspberry. They have blighted somewhat in the nursery, yet the three trial trees have done remarkably well.

Our Patten's Greening did better this year than usual. In 1899 and 1900 they were troubled with a sort of dry rot, while this season there was none of this trouble. The past season we sprayed them thoroughly with Bordeaux mixture. Was the improvement due to spraying? We had the University apple fruit for the first time this season; we were somewhat disappointed in the fruit not coloring as had been represented.

Apple trees in general made a remarkably good growth the past season; especially was this true of trees of from one to three years' planting. Perhaps the good growth was due to our mild winter of a year ago leaving the trees in a vigorous condition in the spring.

I shall at this time call your attention to the marked difference in the behavior of two plantings of apple seeds by my father, the late H. M. Lyman. In the year 1868 he planted a lot of seed from

the Haas apples which grew near Siberian crab trees, and from this planting he got varieties of very small crabs up to hybrids as large as the Whitney No. 20, but not any large apples. By this planting was originated our Prolific, which is now a tree measuring forty feet spread and has become quite noted in the northwest.

The year 1876 he planted a lot of Wealthy seed that were saved from a barrel of Wealthy apples that grew on three top-worked Siberian crab trees that were somewhat removed from other trees, the adjacent trees having killed down in the early seventies. By this planting of Wealthy seed he originated an exceptionally fine lot of seedlings, which are nearly all of the large type of apples. Many of these are of good quality and high color, and a few are late keepers; nearly all are as late as their parent. Of those set in orchard there is but one crab.

Why so marked a difference in these two lots of seedlings? As evidence of the value of these "Wealthy seedlings" I could call your attention to the premiums they have taken at the state fair since they have been exhibited, beginning in 1896.

In the years 1896, '97, '98, '99, 1900 and 1901 these seedlings, each time a new variety, have taken first premium as "best fall apple" over all other exhibits, an unusual record for any one lot of seedlings. In this lot there are three sweet varieties which are valuable trees, one of which is of very high color. These sweet apples appear to be very hardy varieties; in fact, this lot of seedlings, being over twenty-five years old, have passed through the "test winter" of '84 and '83, which is somewhat a guarantee of their hardiness.

Wouldn't the result of this planting of Wealthy seed lead one to believe that the Wealthy is a thoroughbred and not from Cherry crab seed, as some believe?

This work of originating new varieties is a very pleasant one for any one who is interested in this work. With what anticipations the veteran horticulturist watches his promising new varieties as they come into bearing for the first time!

We have many seedlings that are the third generation from Wealthy seed: that is, they are grown from seed of a "Wealthy seedling." One of these took a premium at the state fair the past season; many have not fruited yet. By carrying this work forward we hope to yet bring out many good things for the apple interests of our state.

We hope to have the pleasure of showing these apples again at the coming state fair, and those who are interested in seedlings will be given an opportunity to judge as to their value.

PRESENT STATUS OF THE PARK QUESTION.

MRS. W. E. BRAMHALL, ST. PAUL.

The present status of the forest park question is the subject assigned to me upon your program, but a preliminary word is necessary because the matter has had a steady evolution in our purpose.

The original desire to protect a bit of the last remaining primeval forest in the state arose from the fact that these forests are a windbreak, an additional protection to the source of the Mississippi and its surrounding lakes, and a natural sanitarium, the pure resinous air of which it should be a sacred duty to preserve to the free use of the people and their posterity. Also we know that the Indians, who had become wards of the nation (which had thereupon administered their lands and timber), had been, in spite of government surveillance, robbed. Between one-seventh and one-third of their timber is gone, and they, who owed nothing in the beginning, now are indebted to the government to the extent of a million dollars. A determination arose within us that the opening of this reservation in Minnesota should not add to this scandal and outrage but be conducted in a different manner, and one that would secure their rights to them.

But no study of this subject could advance far without appealing strongly on the economic side, which through scientific forestry offers a possibility to obtain and secure all the before mentioned aims and objects and yet administer this forest upon strictly business principles. Minnesota can have within her borders a permanent growing forest with an annual yield of lumber, an object lesson in forestry, and at the same time it can afford to a people far from the Rocky or Adirondac Mountains the refuge of a health and rest resort of recognized medicinal value in pulmonary or bronchial diseases. The beautiful lakes may be shaded and protected, giving the rich heritage of a beauty spot that may yet be made of economic value, nearly if not altogether self-sustaining.

New York sacrificed her forests. At enormous expense she has bought back and reforested her cut-over lands. Minnesota, young and sparsely settled, will not be able to repair her mistake for many, many decades if she does not profit by New York's experience and avoid the error. New York has rebought and has under forestry now over a million acres; Minnesota is twice the size of New York, and yet when we ask for a couple of hundred thousand acres to be preserved to us, a great outcry is raised, in the interest of the lumbermen who are waiting for this last rich plum, that we are "asking too much" and "tying up the land from settlement."

I want very briefly to tell you what our plan is, or the outline of suggestion at least that we have worked to have adopted. The country embraced in this reservation comprises 800,000 acres, 200,000 acres of which are water. The Indians have taken in their allotments over 100,000 acres (I am speaking in round numbers), which leaves something like 500,000 acres of land. The government has surveyed some of it. When there is less than 17,000 feet of standing pine upon a forty-acre tract it has been put down as "agricultural land;" when the standing pine equals or exceeds that amount it is scheduled as "pine lands." As the official records stand, upon this arbitrary classification, there is almost 400,000 acres of this so-called agricultural land, although nothing is indicated of its capacity for agriculture. It is the remaining 100,000 acres of "pine land" (if this survey be verified) that we are asking to have created into a forest reserve.

That would mean that as trees or portions of forest were or became mature they would be harvested. It would mean a permanent force of men with habitations for their families, put by the government in charge to secure the best and most rapid reforestation. It would mean good roads. It would mean a large industry founded in a part of the state that is adapted to it as it is to nothing else. Only by man working with nature can he achieve the best success. Southern and central Minnesota can depend upon agriculture by itself, but northern Minnesota if its resources are to be developed must make its tree culture profitable to help out its scantier agricultural possibilities.

This is a matter that might well command the careful attention of our representatives in congress while there is yet time to save this forest. One of those congressmen who would have taken the deepest interest in arriving at a wise solution of the future cultivation of this country is reported to have said that "in his opinion the best thing to do with a tree was to cut it down and make a home for a settler." A half truth is very dangerous. We may all agree with him about that, but why should he object to having that tree cut in such a manner that there would be another pine tree next year for another settler's home and still another the next year and the year after that. (Applause.) The apathy of our congressmen, which if continued will result in the exploitation of the country by a few lumbermen and townsite men for their own benefit, could not be if the good people who sympathize with this movement would make their interest known and demand good legislation for this proposed opening.

The presence of pine in such large quantities usually points to a deficiency of mineral substance in the soil, and it is an open secret that there is but little of this land agricultural land, and what there is not of the best quality.

There might be farms and villages here if adjacent forests conducted on forestry principles could supplement them, furnishing additional labor while adding to their earnings a certain forest crop, as is the case in Germany, where forestry is conducted on a scientific basis. It is the very bulwark of Germany's substantial financial prosperity.

As long as this reservation is in the hands of the government it is Minnesota's opportunity to have it set aside and secure government help in rendering it of permanent value. We have been assured again and again by those in a position to know at Washington, that if our delegation at Washington want it they can have it, and yet, members of the Horticultural Society, our delegation is not asking for it, and they are not asking for an investigation. The investigation is the vital point. Before any intelligent measure can be passed there must be a geological survey to show if there be real agricultural land and where it is located.

Just a word as to what has been done. Three years ago, with the above-mentioned objects in view, we succeeded by means of a memorial of the Minnesota legislature in withdrawing the land from the sale which had been fixed to occur May 10th, 1899. Since that time we have sought by every means in our power to secure an investigation of this reservation to determine by what method it can best be opened and made of permanent benefit to the state. One or two politicians from northern Minnesota, doubtless inspired by lumber interests, scouted the plan. Publicity was given to the charge that we were trying "to tie up good agricultural land," and an effort was made in the interest of these few powerful ones to make it appear that southern Minnesota was trying to isolate northern Minnesota! As a matter of fact, two railroads run through that section, and Duluth is as securely connected with the wheat fields of Dakota as though the railroads were to run through a wilderness of stumps instead of the rich and prosperous enterprise we would have established there. There has been a constant policy to confuse and misstate our purpose. In whose interest can this be?

We do not forget that lumbermen have done useful service in opening up this great country to an advancing civilization. But, in the hurry of the country's youth, with its vast expanse of forest, they have been permitted to do it in a reckless, improvident way,

which, in the light of today's knowledge, would be fatuous to longer tolerate.

We supposed our forest wealth unlimited! And today the very nation is alive to the necessity to protect and foster it. The expert foresters say at the present rate of consumption the forests of the United States will supply timber for an hundred years. This does not take into any account the growth of our export trade in timber, which since the opening of Pacific traffic is of vast importance; neither does it regard an increased consumption assured to a rapidly growing nation like our own; while it is acknowledged, even by the lumber interests, that the end of the white pine industry of the northwest is already at hand unless the forests be put under scientific management. But these facts do not in the least lessen the rapacity of those who wish to acquire this forest wealth for themselves and now.

I want to call your attention to one matter. When the lumber is taken the land is thrown open to settlement. Speculators in townsites and farm(?) lands induce people at a distance and emigrants to buy it. It is a wicked, pernicious fraud and on the side of honesty should be stopped, because people cannot raise crops on sand barrens covered with stumps any more than of old could figs be grown from thistles! On these poor farms a bitter struggle goes on for a time, and then the discouraged settlers are very apt to drift away to the richer lands, of which there are still such wide acres. Then is, indeed, the northern part of the state given over to a desolation that is well nigh indescribable. Witness the desert sands of much of northern Michigan and northern Wisconsin. This, too, will be northern Minnesota's experience unless we can protect it now.

Failing to secure any concerted action in our congressional delegation it was again necessary to resort to the legislature of 1901. We presented a memorial asking that if the "investigation proved it practical, desirable and advisable to set aside and devote to park, sanitarium and forest reserve purposes the non-agricultural land that then steps be taken so to do and laws enacted to accomplish such result." The senate passed it forty-five to five and the house of representatives sixty odd to thirty-eight. Owing to an addition of a sentence relating to the vote of the members being attached, which was added in the house, and not reached for consideration by the senate at the time of adjournment, the Duluth papers announced that it had "not passed." But our overwhelming majorities showed the sentiment of the state, and the records have been sent to Washington.

Last summer we appealed to Secretary Hitchcock to ask the Secretary of Agriculture to assist in the investigation by giving the service of a trained forester. Our fear was that the report by an official of the Interior Department, unskilled in knowledge of soils and forestry, would fail to put it upon a practical economic basis. So far we have been unable to obtain this on the ground of "causing delay," and at this time—a full year later—that is still the excuse of Mr. Page Morris and Mr. Eddy, an "investigation would cause delay!"

We want to show plainly what can be done with this reserve if the lumber barons are not permitted to wrest it away, as they did the reservation at Red Lake, where they acquired timber at ten cents on the dollar. We want to show that the Indians can be honestly paid in full. We want the timber lands placed under the management of the National Bureau of Forestry with their title in the government, and we are willing to have all the agricultural land opened up to settlement. But it is folly to use poor land for agriculture when by using it for what it is adapted—tree culture—it yields a larger annual revenue.

Some one spoke this afternoon of the tariff on lumber. I want to say just a word about that. Lumbering is in a transitional stage. Lumbermen—many of them—realize that their old methods will not be available in the future, when they will have to conduct lumbering on business principles, looking beyond the immediate moment to permanent operations. When the time comes that they are ready for concerted and intelligent effort, legislation will come along several lines to expedite and render possible so important an industry, which under the present system of taxation claims some excuse for being irrational and wasteful.

The history of lumbering in Europe and in our own country shows us that this is a vital question and that our forests if we are to avoid great hardship and impoverishment must be administered, as in Europe, with economy and knowledge.

Minnesota has now one million acres of cut-over and vacant land. Can we not have several hundred thousand acres left in forest?

I think our delegation in congress would not venture to allow this opportunity to pass from our state if the people would write and demand it of them with unmistakable interest and hold them responsible for its final settlement. There are tremendous possibilities for Minnesota if we learn to use and not abuse our forest wealth.

Mr. A. F. Brayton: Have the Indians taken their land in allotment right around the lake?

Mrs. Bramhall: Not entirely; it is scattered.

Mr. Brayton: Is it near the lake?

Mrs. Bramhall: Not usually. They usually try to get what is called agricultural land. The Indians are very anxious to stay on the reservation, and their wisest chiefs favor our plan, which if it could be carried out would afford them work in the lines that they are naturally adapted for. It would open up to the Indians reliable employment.

Mr. Brayton: You say the recommendation failed to pass the legislature. I want to know whether it was through the influence of the lumbermen?

Mrs. Bramhall: It was the general understanding, though not all the lumbermen are against us by any means. There are many lumbermen who are not interested there, who do not care; and then there are men who own townsites, and they want the timber taken right off—and their influence is used against us.

PREPARATION OF SOIL FOR THE COMMERCIAL ORCHARD.

J. C. HAWKINS, AUSTIN.

The first thing, realize the saying that "Whatever is worth doing is worth doing well" is especially true of orcharding. Investigate the subject. This will convince you that you can well afford to give the preparation all the time and labor it demands.

Good corn land is good for an orchard if properly enriched and cultivated for a term of years. Give it a good coat of barnyard manure and plow it not later than September. In the spring following, as soon as the ground is in condition start the pulverizer, following with the drag, and keep the drag going at intervals of a few days until the time arrives to plant the corn. Immediately after the corn is planted start the drag again and continue at intervals until the corn gets too large for the drag. Now start the corn plow and keep it going, and do not permit the ground to form a crust or weeds to mature seed. As soon as the corn can be harvested plow the land.

Early the following spring drag and get the ground in good tilth, and then sow to barley, and seed with clover, with at least ten pounds of clean seed per acre. The land being in such fine tilth, we are sure of a good stand of clover.

This is the third season, our crop is clover, it wintered well, and there is a fine stand. By the forepart of July one-third to one-half of the clover blossoms will have turned brown. Now start the

plow and turn everything under five to six inches deep, smooth and clean. In two to three weeks go on and give the land a thorough dragging and by the first of September pulverize the ground with the disc-harrow. By the twentieth of September start the plow again, turning the furrow seven to eight inches deep, and follow with a subsoil plow, going sixteen to eighteen inches deep. This breaking up of the subsoil will form a reservoir that will gather and retain the fall rain and water from melting snow all through the winter and spring. This is very important. The future orchard will certainly require all the moisture thus stored for future need. I am thoroughly convinced that more fruit trees die from lack of moisture than from all other causes combined.

In the spring, as the ground gets in proper condition start the pulverizer and drag and keep at it at intervals of a few days when the soil has become warm and in fine tilth—and you are now ready to set out the trees. In future years you will be greatly gratified and be abundantly repaid for all the time, labor and pains taken in the preparation of this foundation for the future orchard.

Mr. Richardson: I don't know how it is down where Mr. Hawkins lives, but where I live the extreme cold of winter and the occasional dry seasons make the subsoil fine enough. I have seen the time when by removing the top sod from the ground you could shovel the subsoil out nearly as readily as gravel. It was thoroughly dry, but the clay was in little round balls like gravel.

Mr. H. V. Poore: In the section of country I live in that method is not the one to follow. I have seen our ground so saturated with water that a horse would go down to his knees. A commercial orchard planted that way would not do at all. I have gone down forty feet with no other implement but the spade, and I do not believe such a method could be applied in that kind of soil. I believe a great deal of the information gained here cannot be applied everywhere as a general thing. Our state is so variable in many little details, the climatic and soil conditions are so different, that no general system can be adopted, but something adapted to our various conditions, climate, soil, etc., is what we wish and must have in order to achieve success, in my opinion. I have seen twenty-four years of such a variable condition of climate, soil and moisture that it has puzzled me to come to any definite system, even with what might seem conclusive experience. With a certain system I may make a complete success one year, and with the same system make just as complete a failure the next year. In the orchard I have had no trouble with trees planted with an ordinary preparation of the soil.

Mr. Van Ness: I would like to inquire which is the better ground for plums, sandy soil or a heavy clay soil. I have nearly all my plums in heavy ground, but I have a sandy piece I would like to put into plums if it can be recommended.

Mr. Elliot: If you have sandy land with an under drainage of clay it is all right for plums.

Mr. R. H. L. Jewett: I do not like some ideas to go out in this paper on subsoiling without a little more reference made to some points. I deem it very important that the society recommend the location of orchards on elevated ground, the higher the better. Ordinarily in this state our ground has clay subsoil and is not subject to that condition our friend has described. To conserve the moisture we get on higher ground. I think it is important that the ground should be pulverized as deep as possible.

Mr. Elliot: We have all kinds and classes of soils in all manner of conditions. Now, any one planting an orchard in order to be successful with it must study the conditions of his soil. He has got to study his soil before he does his planting if he expects to make a success, and what will do for one location will not do for another. Every one that contemplates planting must work out this problem. Mr. Hawkins is all right where he is located. It may not be all right for Mr. Poore or for Mr. Richardson, but each of these gentlemen will have to adapt himself to the soil he has to work with.

Mr. Jno. Freeman: I was the reader but not the writer of that paper, and personally I have had very little experience with subsoiling, but for your information I will say that when Mr. Hawkins handed me this paper he mentioned this point as one of the strong features of his paper. I do not know the nature of his land, but he made a strong point of the necessity of subsoiling in his section of the country.

Mr. Higbie: I would like to ask one question. If taking pasture land containing all blue grass and timothy sod, preparing it in the fall and planting trees in the spring, would be an advisable way of setting an orchard. Has any one ever experienced in that way?

Mr. Philips (Wis.): Yes, you can do it.

Mr. Higbie: Would you advise plowing it in the fall and replowing it in the spring, or can it be prepared to plant in the spring?

Mr. Philips: If you commence the latter part of June you can have it very nice for spring planting.

Mr. O. W. Moore: In regard to this subsoiling question, I am not very familiar with it, and I do not say that it would be the proper thing to do for every locality, but I think we have one guide in southern Minnesota, take it in Houston and Fillmore counties, where we have clay subsoil on our land and rock to within four to twelve feet of the surface. There I think it is safe and essential that the ground should be subsoiled before we plant trees.

Mr. Yahnke: I thought I would not say anything on this subject, but I must chip in a little bit. I have had quite a little experience in subsoiling, but it will not do for every man to practice it no more than bees will cure ague in every man, but go to work and subsoil your land for trees in the fall wherever necessary, and subsoiling is necessary everywhere where there is clay soil; and where the ground has been plowed many years you will notice it

has a hard pan formed caused by plowing every year at the same depth, and if this hard pan is not broken up it will act as a header for the surface water, which cannot penetrate the soil, and the least drouth will dry out such a soil in such a way that it is almost impossible for a tree to live. If you break up this hard pan it will accomplish a great deal of good. We have a good deal of ground throughout the state where this hard pan is never disturbed by the plow. Now subsoiling is not beneficial where there is a sandy or gravelly subsoil; there it is a detriment. It is not a good thing to practice on steep side hills because the earth will wash away, and it is a detriment to be done late in the spring. It is a detriment in one way, because where the ground is subsoiled and it is not followed by a heavy rain it will dry out quicker, but where you subsoil in the fall you can prepare your ground for spring planting of trees, and you will have an excellent preparation for the planting of an orchard.

Mr. Elliot: There is one point in regard to subsoiling that we want to take into consideration; you do not want to bring that lower stratum up to the top. You want to use something with which to subsoil that breaks it up in the bottom and leaves it there.

Mr. Yahnke: We can do that by taking an old plow and taking off the mouldboard. Any blacksmith can do it, or you can do it yourself.

Mr. J. S. Parks: I think the time is coming when we will recommend underdraining a good deal of our prairie soil instead of subsoiling.

LAYING OUT THE COMMERCIAL ORCHARD.

R. H. L. JEWETT, ST. PAUL.

Our first thought in connection with the question is that it is of minor importance how the orchard is laid out if but we plant good varieties, set and cultivate them carefully, but as we consider how much the environment of a fruit tree may affect its growth and fruitfulness we come to the thought that we may assist nature somewhat and so arrange our orchard rows and place the trees in such relation to one another as to give mutual protection against trying winds and blistering sun, and make this arrangement afford the most favorable conditions for proper sunlight and air.

Sunlight is essential to the growth of our trees, and we must have sunlight upon our fruit also if we expect the highest results in flavor and color. On the other hand, the scorching sun in early spring or late winter, when our trees are without foliage, burns the trunks and larger limbs, and our trees are weakened if not destroyed.

Again a proper circulation of air is necessary in the orchard. How many times when our trees are in full bloom in the chill of May evenings, when the mercury in our thermometers is gradually running down dangerously near the 32° mark, we anxiously watch for a breeze to set in and start a current of air among our trees and save us from the frost! In the heated days of summer, after the showers, when the hot, moist air comes up from the ground almost like steam, putting our fruits into just the condition to be affected by many kinds of fungous growths, we long for an open way for a favoring breeze that shall blow away the fungous spores and cool down our fruits and save them from scalding.

The larger portion of our state is more or less subject to long periods of high winds during the late summer. These winds are mostly from the southwest, and if our trees are exposed to the full force of these winds our fruit is blown off when half grown, the heated winds dry up the limbs, and further growth of fruit is stopped, or the fruit prematurely ripened.

Can we by any arrangement of our trees take advantage of the necessary sunshine and air and avoid some of the evils produced by the hot sun and high winds? I think we can do this to some extent by setting our trees close in the row, placing the rows some distance apart and having the rows run in about the direction a pole will give shadow when the sun is at its fiercest heat during the day, which is nearly the direction of the prevailing winds, northeast and southwest.

Let the rows be laid out far enough apart to give ample room between them for cultivating, especially needed after the trees are of good size, as then we can cultivate without injury to the outer branches. We shall need this room to pass through with teams, to remove the fruit when picked, to run a barrel sprayer and to gather up broken limbs and portions trimmed off, where trimming may be needful. We need the open space for air passage and to let the sunlight upon the lower branches. The direction of the rows as suggested will divide the influence of the sun about equally, giving its rays to the east side during the forenoon, the top of the trees receiving the two o'clock rays, while the afternoon sun colors our fruit growing on the west side of the rows.

I firmly believe that we are well on the road to a better and hardier apple tree. Our advanced nurserymen are using crab seedlings, when they can obtain them, for stocks; some of them are raising stocks from crab seed of their own growing; and we are eventually to have a longer lived and necessarily a larger grow-

ing apple tree, and will need to give them more room. Our present judgments are formed from our experiences with short lived and weak rooted apple trees.

Unless from necessity of limited space we are forced to crowd our trees, let us be generous with them and give them room to "spread themselves." If to be crowded at all, crowd in the row but leave ample space between rows and govern that space by adapting it to the natural habit of the tree. Varieties in soil as well as varieties in tree should govern distance in the row as well as distance between rows. In a poor soil and with upright growing trees closer planting can be done than where we have a rich soil and plant trees of spreading habit. For the sake of a uniform width between rows in our orchard of over twenty acres we set our trees sixteen and a half feet apart in the row, and set the rows thirty-three feet apart, and in four-fifths of the orchard the rows run northeast and southwest.

Mr. Philips (Wis.): My first orchard I set east and west, but set the trees thirty-five feet, gave them ample room, and then set a row thicker between, a row of some alternating trees, like the Wealthy and Longfield, that will give you fruit before the other trees, like the Northwestern Greening, come into bearing. In that way your early trees will give you apples while the later ones are coming into bearing, and by and by when your trees get larger you have them fifteen feet apart, and you can take them out; in that way you will have a pretty good orchard. That is the way Mr. Wellhouse does. He sets his late apple trees thirty feet apart; then he sets in a pippin, and it bears itself to death about the time the later trees come into bearing. You can criticise the plan if you want to, but I think it is pretty near right.

Prof. Hanson: How close together are they planted?

Mr. Philips: I do not always practice what I preach—about 15x35 ft. When I find they are crowding I cut out the poorest; that is the way the world works.

Mr. Jewett: We recognize the necessity of a windbreak. This plan I propose is practically a windbreak in itself; it makes one tree suffer the penalty of being in the way. For instance, this tree (indicating) has to bear the force of the wind. To save the fruit and for other reasons we have in our orchards set the first tree in each row an evergreen, and in addition to that we have made an alley every twenty rods. We have adopted that twenty rod system for the sake of uniformity in size. Each one of our plats contains a quarter of an acre, and in raising strawberries we know just what the result is. Then in each row we grow the evergreens to form a partial windbreak. There is an aesthetic view about that; the evergreens look nice.

The President: That is something like my old friend McEwen when some one told him he ought to put something under his haystack. "Why," he said, "I never put up a haystack that I do not put a ton of hay right on the bottom." (Laughter.)

Mr. Perry: At Excelsior our orchards are planted close. Mr. Stellar has a large orchard, on Murray Hill, that is bearing a crop every year, where the trees are set 12x15 ft., and they are a perfect success without any care. I am setting my new orchard of 2,000 trees 15x20 ft. north and south, fifteen feet between the rows. I do not believe our trees are going to last forever. I expect to see them die. I plant my trees close together.

Mr. Jewett: I would like to ask my friend whether that is the way he would plant an orchard of Lyman's Prolific? We are going to have longer lived trees, we are going to have hardier trees, and we will need more room for them.

Mr. Perry: I am going to plant one hundred of the Lyman Prolific and plant them on the outside of the orchard so as to give them plenty of room.

Mr. Busse: I think in planting thirty feet apart each way there is a great deal of space that is not occupied that might as well be. I set out a good many trees at different times, I don't know just how many, but I have upwards of fifteen hundred apple trees and others, and I set my trees 16x16 ft, the Virginia crab and the Hibernal about twenty feet apart on the outside for a windbreak. That is the tree for a windbreak. I don't know anything about the Lyman Prolific, but the Virginia will spread forty feet. That is ample space. Thirty-five feet I think is too much for such as the Wealthy, Duchess and Longfield. They will not touch each other for years to come, for their habit is to grow a straight and upright tree. I also set my gooseberries and currants so there is five feet between them each way. I think there is too much land used; usually you can get a good many more trees upon an acre.

Mr. Lord: Probably no five men in our country have taken as much pains and sell as many apples as Mr. Blair, and I would like to know what he recommends in regard to distance.

Mr. C. L. Blair: I would say that I believe twenty-one feet is about the distance, and while the orchard is young you can grow corn between the trees and cultivate while the trees are young. That will make your apple trees come in every sixth row, if your corn is planted three and a half feet apart. I have never tried planting the rows thirty-three feet apart and setting the trees ten feet apart in the row. In my first orchard, of several hundred trees, which were all killed in the winter of 1884-5, I set the trees sixteen and one-half feet apart each way. I found they were too thick for trees that are long lived like the Duchess, for instance, and I have now adopted the plan of setting twenty-one feet apart. That may be a little too close for some purposes, but I like that plan as well as any I have tried. I like to have natural grove protection, which many of you people do not have, so as to keep off the southwest and the west winds. I think a grove for protection on the east is not so necessary, although I like protection on all sides.

Mr. J. S. Parks: It seems to me the theory of setting trees as recommended here is on one side and practice is on the other. Now I want to recommend another theory. Why not set trees four feet apart each way, and you will get lots of apples depending upon the "survival of the fittest." I have had lots of apples. (Laughter.)

Mr. Van Ness: I have seen orchards in Minnesota 15x20 feet apart, and they told me the trees were planted too close together. It was impossible to drive through with a team after they had made some growth, and many people are going to set them 30x40. That is the distance recommended by the man who sold me trees.

Mr. J. P. Andrews: I just want to say that I set an orchard in 1878 and put them fourteen feet apart. The Duchess and a number of other varieties are entirely too thick, and the orchard I planted three years ago I set 15x24 feet, and if I had to plant them again I believe I would widen them a little more.

Mr. A. J. Philips (Wis.): I set everything too thick, forest trees and everything else. Mr. Blair likes a distance of about twenty-one feet each way. Mine are set 28x16, and my Wolf River, Walbridge and Duchess were set twenty-eight feet apart. I set a man in there mowing, and he could not get through with the mower. Those trees were twenty-eight feet apart, and yet you could not drive a team between them.

Mr. C. E. Older: Mr. Patten has a scheme for setting them out and then breaking joints as it were. He sets the rows 24 feet apart and then sets rows between, and then leaves an open wide space for circulation.

Mr. H. V. Poore: When I first commenced to plant forest trees on the prairie the old tree claim law called for a distance of 8x12 ft. and then later extended that four feet. From what I have observed for twenty-four years and from my experience I think I should put them about 8x12 ft. The first trees I planted I placed 20x12 ft., and now there are two trees left that are twenty feet apart. I think 8x12 ft. is plenty far enough apart. Until you can adopt some method of protection do not speak of thirty-three feet on the prairie. There is only one orchard in the county successful, and those trees are set 16x20 ft. and the man is fortunate enough to be in such a situation that the wind cannot strike from the southwest. There is a grove right by his house about twenty rods from the orchard, and he has had from eighty to a hundred bushels of apples the last four years; but how long it will last I do not know.

Mr. Paul Burtzlaff: I have noticed that some of these apple growers pretend to cut out their trees when they become too thick, but they don't. They go out and look at the tree and think it is a very nice tree, too bad to cut it out; they will wait just another year, and then they will cut it out. The tree looks just as nice the next year, bears a good crop of apples, and when they go out with the ax they say they will wait another year; and so it goes; but if they did cut out every other one the trees that were left would be ruined.

Mr. W. J. Tingley: I plant my trees 18 feet 4 inches apart, put them just five links apart, and set the rows east and west.

Mr. Underwood: This is a very important question and there seems to be much diversity of opinion as to the best method. I think planters need to be very careful in adopting any rule, and if the experience that I have had is worth anything it is in support of the proposition to plant trees only a reasonable distance apart. We planted an orchard of six thousand trees that were 14x16 feet apart. The distance came naturally that way because of the growing of nursery stock among them when young. That was too close, and I will tell you why. When those trees came into bearing there was one block of 600 Duchess—and they are a pretty hardy tree, but as they came into bearing they should have had a great deal of moisture and sustenance; but they did not get enough of it, they choked to death for want of moisture—and I have got to be a crank on the idea that we must have moisture in our orchards. If you plant them so thick that there will be only a few drops of moisture for each tree, how do you expect them to produce a crop of fruit? My 800 Duchess and over 1,500 Wealthy choked to death because they were planted too thick.

However, you can go to the other extreme of planting them too far apart—but everything must be done with a view to furnishing them enough moisture when they come into bearing. They get moisture enough when young, they will live in grass and weeds and by mulching, but my experience is that they will not live a great while in any condition if they are not furnished enough moisture when they come into bearing. Perhaps you can make a success of an orchard in that way, but with me it would mean failure. I have tried the other way on a large scale, and I have got all I want of it.

It takes a good many men a long time of practical experience to establish the best rule to govern in this case, because it takes a good many years, fifteen to twenty years, before the trees bear large crops of fruit; but I imagine twenty feet apart would be a good distance to plant, and I would like to have them equal distances apart each way, because in cultivating I want my implements so adjusted that I can thoroughly cultivate one way and then go the other way. Consequently, I prefer to have them planted equal distances apart each way. To explain that point: We are using a spring-tooth harrow. Now the branches of our large trees overlap, as they do in our original planting, the trees are too thick, the branches overlap some, and we cut them out so the team can walk through the center of the row, a medium sized team without any harness except hames and traces. We spread this harrow apart so it will cultivate next the trees, the horses going between, and we go through the orchard in that way. Then we put on a short evener and cultivate the center of the row. If your trees are different distances apart, your implements will not work so conveniently. If I were to plant an orchard now I would think twenty feet apart each way would be about the right distance, for the reason that it would conserve the moisture, because otherwise there would not be enough moisture when the trees came into bearing, and they would not have enough sustenance to go through the winter—and another reason would be for convenience in cultivating.

Mr. Higbie: Would you change that rule in planting a steep side hill?

Mr. Underwood: Of course, in hill planting you cannot cultivate, and you would have to adopt some other method of furnishing moisture.

The President: Do you follow the contour of the hill in planting?

Mr. Underwood: Yes, in our side hill planting we conform to the surface. We follow the outline of the hill. Then we have to have moisture enough to go round, and, of course, we would have more moisture on the north side of a hill. I think twenty feet would not be too far apart then.

Mr. Jewett: Something has been said about the custom of planting them in rods, a certain number of trees to the acre. I explained that the arrangement of planting them 33x16 feet is arbitrary. The form is what we contend for; 16x33 feet would give us the same number of trees to the acre as if planted twenty feet apart. You plant your rows thirty-three feet apart and put them fourteen feet apart in the row, and you get the same number of trees to the acre as you do by the other way of planting.

Mr. Wedge: I have been setting a few acres in orchard, and I do not know the best system of planting now as I thought I did a few years ago. I feel just as Mr. Underwood does about cultivating. I believe in cultivating and do not believe in anything else, but the first thing I ran up against when I began to enlarge my orchard and put it outside of the level ground was a tremendous wash of the soil. This has occurred a number of times during our heavy rains. I will observe that our ground is only gently undulating, we have no such bluff orchard as my friend Underwood has. The ground is only ordinarily rolling surface, but the wash is something almost beyond comprehension. The only way we could plant was with the contour of the land. Some of the knolls are not larger than four or five times the size of this room, and, of course, we cannot break our rows to meet such conditions as that, so I have been tempted to use a large amount of mulching over a good share of my orchard. I began with close setting, but I have finally adopted the plan of setting the rows two rods apart and the trees one rod apart in the rows. I think there is a great advantage in having the rows wider apart one way than the other. It helps out the principle of air drainage in the orchard, and it is especially of advantage in spraying and driving through with the team for any purpose. I have noticed when trees are set twenty feet apart it is quite difficult to spray or to drive through to gather the fruit with wagons or racks. The outer branches are quite in the way even among young trees, and I think it would do very little harm if they were crowded a little. I have to fight against root-killing. I do not know what Mr. Underwood's plan is to avoid root-killing. I do not believe cultivation will do it; perhaps mulching will do it; but it is a pretty serious thing in our orchard. My plan at present is mulching. Mulching and deep setting, as Mr. Andrews suggests, is a good thing, but even the Hibernal will kill in our severest win-

ters. I am an advocate of reasonably deep setting. I believe in getting trees on their own roots as far as possible.

Mr. Blair: I would make one suggestion, and that is that any method that will hold the snow in the orchard will prove a very good remedy against root-killing. I never knew trees to root-kill where the snow could be held in the orchard. Any method by which we can hold the snow will help to solve the problem.

Mr. Older: In setting my own orchard a number of years ago I set my trees twenty feet apart each way. Mr. Somerville came to look at my orchard, and he admired everything very much, but he said I could raise twice as many apples as I did by putting in just as many rows but breaking joints. I did so, but that was a total failure. The other trees had a good start, and we had trouble in getting through, and I dropped that plan. The last orchard we planted we set the rows north and south. The conditions were such we could not set them any other way very well, so we set them ten feet apart in the row and the rows thirty feet apart, and we planted a short lived tree and every alternate one a longer lived tree. The plan Mr. Patten follows is twenty-four feet apart and then plant between and leave a wide open space for some other crop. It is a nice orchard; it is easy to cultivate and yields a big crop.

Mr. Gibbs: Those steep hill sides and undulations are very nice places to set out to apple trees, but the wash of the soil is a very serious matter. I have avoided that difficulty in two different places in this way. In one I had an orchard on a steep hillside, and I dug in and levelled off a space for the tree with a little slope to the rear. I could not cultivate the hillside, and I let the space grow and mowed off the weeds, but I kept that little space back of the trees cultivated. Where I am now I have a smaller number of trees, and they have plenty of rock about them, and there I am terracing the ground the same as they do in Europe for their grapes. It is a good deal of work, but we must be patient with our trees and adapt our methods to the situation.

Mr. O. F. Brand: The point suggested by Mr. Wedge and Mr. Gibbs of saving the soil from washing is a very material one. We have got to protect our soil; we have got to save our surface soil. The southern and eastern states have been prodigal in that matter; they have allowed their soils to wash away until their farms are impoverished. I have noticed that a heavy rain will wash a large amount of soil away. We must cultivate our orchards in such a manner as to prevent that. I do not know of any better way than our friend Blair suggested and is following, and that is in pasturing his hogs in the orchard. I am following that plan myself. We get a pretty good crop of apples without any further cultivation. I have frequently noticed in photographs of different trees, and have also noticed it not only on my own ground but in the orchards of other people, that the trees that produce the most fruit are invariably on the outside or end of the row or where there are vacancies in the row.

THE HOTBED AND ITS USES.

PAUL BURTZLAFF, STILLWATER.

The uses of the hotbed are various, and for a market gardener it is impossible to get along without it, for growing vegetable plants, such as early cabbage, cauliflower, tomato, pepper and egg plants, and for forcing vegetables, such as lettuce, rhubarb, radish and parsley, also cucumbers, for the early spring market. With proper care, they are quite profitable. Two crops of lettuce can easily be grown between the 10th of March and the middle of June; in fact, there is such a demand for hotbed grown lettuce that people want it as long as they can possibly get it. Of course it is more difficult to grow it when the weather is getting very warm on account of the green aphides which attach to it.

The hotbed should find a place in every farmer's garden. It does not take much capital to have one. The best location is a southern slope, surrounded on the north and west by buildings or groves; or if that can not be had, build a board fence about eight feet high. The beds are started in our latitude between the 10th and 20th of March. For growing vegetable plants the 20th is early enough, but for forcing lettuce or radish for the early market the bed should be started about the 10th or before. The material generally used for heating the beds is fermented horse manure. To have best results, and to lengthen the time of heating, secure fresh horse manure, and that of highly fed horses is best. Haul this to a heap near your beds. Do not make the pile round, but make a long square top pile about four or five feet high. If it does not start to heat readily, pour a few buckets of water in the center of the pile, which will most generally start it.

The first fermentation is nearly always irregular; that is, it begins at several places. In order to make the fermentation uniform, the pile may be turned occasionally, taking care to break up all hard lumps and distribute the hot manure throughout the mass; if the manure is very dry moisten it with warm water. The best results are generally obtained from manure from livery stables, which does not contain much straw and can be gotten fresh. It is sometimes necessary to turn the pile three or four times before it can be used, but two times is ordinarily sufficient. When the pile is steaming uniformly it is fit to put in the frames.

The frames generally used are made movable; the size is about six by twelve feet, to hold four sash. They are made of inch lumber. If one expects to use hotbeds every year, however, it is advisable to make the frames of two-inch lumber, well painted, and to join the

parts by bolts or tenons, so that they may be taken apart and stored for the next year's work. The depth of the frame must be governed largely by the plants which it is desired to grow, and by the length of time they are to remain in the bed. Have your plants just as near the glass as possible and yet give them room in which to grow. When beds are started in the beginning of March the frames ought to be deep enough to hold about sixteen to eighteen inches of packed manure and six inches of dirt, and leave about six inches for the plants to grow in.

It is a common practice to dig a pit under the frames, about twelve to fourteen inches deep, and it should be just as wide as the frames. Have the north side of the frame about four to six inches higher than the south side, to allow water that drops on the glass to run off. Before putting the manure in the frames scatter several inches of dry straw or leaves on the bottom of the pit and then put the hot manure in it, being careful to spread it evenly all over the bed. Fill your frames within several inches of the glass, tramp it some near the frame but press it only slightly with the fork in the center. Then put on your sash, and at night cover the sash with boards or mats. In about three or four days, when well started again, take off the sash and tramp well all over the bed. Care should be taken to have the corners and the center well filled, that an even settling may be secured. The center especially wants to be well filled and packed down. Fill in enough manure so that when the dirt is put in it will be within an inch or so of the glass, for by the time your plants are larger the manure will have settled enough to leave six or seven inches between the dirt and the glass.

When the manure is well packed put on the dirt to the depth of about five or six inches. This should be quite rich and contain a large amount of sand and humus, a compost of decomposed pasture sod with one-third their bulk of well rotted manure being excellent for the purpose. This dirt should be collected and mixed the fall previous, hauled into a heap near the beds and covered with straw and manure to keep it from freezing so hard. After your dirt is put in the beds leave them for several days to start all weed seeds; then pulverize the surface with a rake and make it even, and your beds are ready to receive the seeds or plants.

For a market gardener it would be cheaper to build a small-sized greenhouse, heated with hot smoke, to raise seedlings in and transplant from there to the hotbeds. Ordinarily the manure will heat very vigorously for a few days after the dirt is put on, and great care should be taken not to get the plants in too soon. A

soil thermometer should be used. When the temperature has passed below 80° or 70° there will not be much danger of losing the plants.

The proper size of sash to be used is not longer than six feet and not wider than three feet. Regular hotbed sash are made with the sash bars running one way, the glass being lapped the other way. This lap should not be more than one-quarter of an inch, for if more water collected in between the glass would freeze and crack the glass. The best putty to use for hotbed sash is liquid putty. This is made by mixing one-third boiled linseed oil, one-third white lead and one-third putty. This can be applied easiest with a putty bulb. All joints should be well painted before being put together.

Only by experience can one learn how to manage a hotbed. There are a few principles and cautions, however, which may enable one to arrive at the knowledge sooner, and with less loss than by blind experience only. The things to be sought, so far as the plants are concerned, are specimens which are ready at the required season, which are stocky and which have made a continuous, healthy growth. The things to avoid are, the chilling of the plants, too hot and too close atmosphere, which tend to make the plants soft; crowding the plants, which tends to make them weak and spindling; growing the plants too far from the light, which also tends to make them soft and weak; the scalding of the plants by the hot sun, an injury which is very likely to occur when the sun comes out after a long spell of dark or cold weather or watering plants when the sun shines too warm; the wilting of the plants, due to too great heat and too little moisture.

The principal features of the actual management of a hotbed may be noted as follows: (1) maintaining the heat, (2) watering, (3) ventilating, (4) hardening off, (5) transplanting.

Above all things the plant should be stocky when it is put in the field. A stocky plant is one which is comparatively short and thick, is able to stand alone and which has a normal bright green color.

The maintenance of ordinary hotbeds depend on the quality and the amount of manure. Heat will ordinarily fail sooner if the hotbed is above ground, and much exposed to winds. It may also be lessened by careless watering, particularly by soaking the manure. Not only should the heat from the fermenting manure be maintained, but care should be taken to prevent too much of the heat from escaping. This is an important caution in very cold

nights and during windy weather, at which time the frame should be protected by shutter, boards or mats.

Watering should be done with caution. Use rain water, avoid ice cold water and do not water too much so as to puddle the ground. Water thoroughly, and don't water again until the plants need it. In the early part of the season water in the morning to avoid the plants going into night quarters with wet foliage; as the weather becomes very warm, water toward evening, or the hot sun will evaporate the moisture out of the ground before it is thoroughly soaked in.

Ventilation is very important, in fact, the most important point. On pleasant, sunny days, ventilation should be given by raising the sash, resting it in a notched block, always opening the sash contrary to the wind. Beginners generally ventilate too little rather than too much. Whenever the water collects on the panes, ventilation should be given if weather permits. As the plants grow, more and more ventilation should be given, and finally on bright sunny days the sash can be stripped from the frame. In this way the plants become accustomed to a lower temperature. This, of course, only applies to plants which are to be transplanted to the open ground. For forcing lettuce the sash must never be taken off.

Plants should be transplanted at least two or three times before they are set in the open ground. It makes them grow stocky and gives them a better root development. In case of celery and cabbage the tops should be sheared. Cabbage plants ought to be completely hardened, so that they can be set in the open ground about the last week in April. In hardening cabbage plants care must be taken about leaving the sash off the first night, selecting a night when there is no danger of frost. Do this for four or five nights, and your plants will withstand a slight frost.

Another important point is shading forcing vegetables, especially lettuce. This can be easily done by whitewashing the glass.

THE ORNAMENTAL IN HORTICULTURE.—In a recent letter the popular landscape architect who signs his name below says:

"I am very much interested in the progress of the Minnesota State Horticultural Society. The amount of attention given the improvement of home grounds is something of a revelation to realize that this work is taking such a strong hold upon the mind of the public."

Boston, Mass. WARREN H. MANNING.

ANNUAL MEETING, 1902, WISCONSIN STATE HORTICULTURAL SOCIETY.

[Held at Madison, Feb. 3, 4, 5 and 6, 1902.]

WYMAN ELLIOT, DELEGATE.

The meeting was held in a large room in the Capitol building, fruit exhibits at one end, containing 130 plates, the extent of the exhibit, by nine exhibitors, Northwestern Greening and Wolf River leading for size and appearance. A few seedlings were on exhibition, none of special merit commercially.

Meeting called to order at 10 a. m. Invocation and a few well chosen words from the president was followed by appointment of committees. Then the topics were taken up in this order:

First. "Strawberries," by J. J. Ihrig, Oshkosh, was full of practical and helpful suggestions to the growers of this delicious fruit. The most experienced and best growers lay great stress on the thorough preparation of the land, subsoiling, using two years for the best preparation of soil, preferring to use old, well decomposed fertilizers, two years in succession, cultivated with potatoes or corn, keeping the land very free from weeds. Planting with none but the very best plants; always spring set, discouraging summer and fall setting. Use no plants from beds that have once fruited; cultivate as soon as plants are set and keep it up each week through the season. More people fail from lack of thorough shallow cultivation than from any other one cause. Winter mulching very essential for best success. Some advocated removal of mulch in spring and cultivating very shallow, then placing the mulch back between the rows; others had good results from mulching and no spring cultivation. Either plan was practical under certain conditions. Distance apart of the rows and the plants in the rows somewhat varied, some preferring 3½ to 5 feet apart and the plants 18 inches to 30 inches in the row. Some advocated narrow hedge rows, others wide, matted rows, but for raising the finest specimen fruit the hill system was advisable. One thought mulching and cultivation of heavy soils required different methods from light sandy soil. Cutting first runners in moist season was best; but in a dry, drouthy season not advisable. In picking, some preferred women and girls, others men and boys. This is a mere matter of choice, owing to which can be obtained to best advantage.

The next paper was by J. L. Herbst, Sparta, on "Picking Small Fruit." Growers give too little attention to this part of this business. To get best prices, the fruit must always be put in new boxes, in clean, neat packages. Use picking stands with not more

than five boxes; shade the fruit as soon as picked. Girls and women preferred to boys; do not allow talking by the pickers; give gum to remedy eating. A number is given to each picker, and his stand has the same number. Two to four pickers to each row. Use a good smart girl for packing, who reports any bad picking. All fruit should be picked with short stem and calix, as it gives a better appearance in the box, that for distant market greener than for a near at hand market.

A table was shown for using in the field, arranged with a cloth shade that could be tilted at any angle either way and high enough not to interfere with the person sorting and packing. The price paid per box for picking was 1¼ cents regular, and adding ¼ cent at end of season to all pickers who remained through the season. The full carriers are gathered by one boy, who will attend to fifteen pickers. Empty quarts are used while carriers are being emptied. The overseer does not carry crates; his business should be to oversee the picking, that the bed is picked clean and no inferior fruit put in the bottom of the boxes. Color blindness is a defect that some pickers cannot overcome—such should be dismissed.

Warfield was thought better than Bubach.

Raspberries.—Nemaha thought to be better than Older. Marlboro better than Cuthbert, somewhat depending on kind of soil. The first is adapted to clay loam soils, the latter to sandy loam soils. Price of picking was discussed, varying from 1¼ to 1½ cents per quart, some reserving the extra ¼ cent to be paid at end of season to all pickers that have staid through the picking season. One reported 158 quarts for a day's picking, and eighty quarts in five hours by another—to do this fruit must be extra fine.

Average price paid by the day was $1.20 for best pickers.

Why girls were preferred to boys was, as a rule, they were better pickers and easier to manage. Question was asked at what point do you dismiss pickers and for what cause? Answer: Dishonesty in filling boxes, disobedience; dismiss the third time detected. Reformatory measures should be used with the most expert pickers. Willingness to learn should at all times be considered. Some growers hire ten and twelve boys by the day, using them pulling weeds and other work when not gathering fruit, adding pickers by the quart in the rush of the season.

The next paper on the program was by that experienced orchardist and small fruit grower, A. L. Hatch, from Sturgeon Bay, on "Implements for Small Fruit Culture." These consist largely of such as are used in the growing of farm crops, adding a disk harrow for covering weeds and manure in preparing the land for

planting after ploughing. He spoke of a new implement, the Nation weeder and Breed's weeder, or the Hallock weeder, some preferring one to the other, either doing good service—they are great labor savers in first cultivations, leaving the ground with a fine dust mulch, that prevents evaporation of moisture from the soil. The Ajax and Planet Junior horse cultivators were good implements.

He planted raspberries and blackberries in rows eight feet apart, using two horses with cultivators and weeders—and wide enough for manuring. In pruning he used long two-handled shears or long handled pruning knife. The method of setting plants to be cultivated by Breed's weeder is to put the plant in rows, with a slight depression, set with dibble or spade. Then the weeder slides over the plants without disturbing them, often cultivating with the weeders four times before using the single horse cultivators, emphasizing the most essential point, to start early, before weeds have passed the seed leaf stage. The great secret of success was in the thorough preparation of the land before planting. Light, friable, loamy soil preferred to heavy, tenacious or gumbo clays. Use tools for cultivation with narrow teeth first week in preference to the wide toothed cultivators, and those with a gyratory motion would be desirable. Several experienced growers favored single horse cultivation, often covering four to four and one-half acres per day.

Next paper, by W. L. Ames, Oregon, Wis., was "Fruit for the Farm." This paper was from the large farmer's view, where a 400-acre farm was managed with little help, employing only two men besides the owner. Size of trees recommended for planting were eight to ten feet high—because he could get them from a near neighbor's and could get them into bearing quicker, often second year. Most planters present discouraged planting so large trees. His trees grew in sod and were mulched with chip dirt and coarse manure, ashes, etc. This method the best cultivators criticised as not being as good as clean, thorough cultivation.

TUESDAY P. M.

"How to Care for the Orchard," by Edwin Nye, Appleton. In selecting varieties, he recommended quality before quantity. To this proposition all did not agree. Many thought quantity with size and appearance outweighed quality, unless with other commercial qualifications added. Vine crops were preferred if the ground between the trees were to be used for crops, especially leguminous crops, accompanied with thorough cultivation; manure often with clover and other green crops, turned under to add fertility to the

soil. Kill all insects and spray for fungous growths. Prune all surplus limbs and foliage away. Discuss and test leading varieties of commercial value with your friends, thereby gaining a broader view of what is best. Pick for winter storage as soon as fully matured and store in cool sheds or rooms until cold weather, then store in cool cellar—selecting all inferior grades and kinds for cider, with which to entertain your evening visitors through the long winter evenings. The closing sentence was: "Let us raise more and better apples." The questions brought out in the discussion were indicative of the locations where those asking lived. Talman Sweet for a winter sweet apple, Wealthy for fall, Northwestern Greening for winter. Would you select an elevation with plenty of air drainage? Yes. Best time to prune? March to April or May, not cutting away too much wood growth at once. The consensus of opinion was to plant two and three-year-old trees rather than large trees, which necessitated cutting away large limbs to balance the top with the root. How long would you prune? Answer: Owing somewhat to the variety and exposure, using best judgment. A good rule is not to have two limbs or two buds touch each other.

If trees are inclined to overbear it is a good plan to prune when the fruit is the size of a pea. When is the best time to prune? March and April, before sap starts; then wounds heal over quickly. Cover all cuts with grafting wax, or shellac paint. A few complaints of rabbits pruning too close to the ground. Wisconsin has a law protecting the rabbit; none to be killed unless by gun, etc. This is of doubtful value.

One thought fall pruning was a vicious practice in the northwestern climate. If mild winter followed, the trees usually went through unharmed. Majority believed in March pruning.

The next paper was by M. S. Kellogg, of Janesville, on "Cover Crops for the Orchard and Nursery." He was a strong advocate of the cover crop as a means for winter protection. He spoke of the sand vetch and winter rye, etc., but was not always sure of a stand; classed rye next to the vetch, using four bushels of seed per acre. This grew about ten inches high and in spring was cultivated out. Sown July 10 to Aug. 1. Oats were much used for the orchard; this covers the ground quickly. The clovers were uncertain of germination. It was thought best not to depend on any one crop but have two or more kinds mixed, as more certain of success. The principal object was early cover to check growth. If clover is used and ploughed under in spring, it would add much

fertility to the soil. Some thought vetch too slow. Barley was mentioned as germinating with less moisture than other crops, and the advantage with barley is it kills down, while rye and clover must be ploughed under. The advantage of clover as a cover crop lies in the nitrogen derived from it when ploughed under. Common field peas were great nitrogen gatherers, and adding 200 lbs. of plaster per acre very materially increases the pea crop. Success with peas depends somewhat with the variety, Scotch green being a very good variety. In sowing, plant three inches deep and pack soil well over them.

Secretary Bassett, from Michigan, was introduced, giving a short speech, wherein he thought the average horticulturist should be possessed with active brains. He knew of no occupation that developed it as fast. Had discovered that we can give too clean cultivation, thereby taking the humus from the soil. Cover crops retain leaves and moisture.

Secretary Latham advocated clean cultivation with a constant dust mulch clean up to time of freezing of the ground in the fall. It conserved the moisture, he thought, better than a cover crop.

The paper to have been prepared by L. G. Kellogg on "Implements for Orchard Cultivation" was called, and Mr. Kellogg said he had not prepared any paper, and the subject was taken up by discussing the various implements in use. Mr. Hatch spoke of the new expanding harrow as well adapted to orchard cultivation. It was arranged so it could be widened to cultivate under the trees. The Acme and cutaway harrows, also the California orchard harrow, were spoken of as doing good service. The expanding disc harrow was reversible, plowing to or from the trees. Those with the most modern ideas of orchard cultivation are using the disc or cutaway harrows, followed by a light smoothing harrow, or Breed or Hallock weeders. These tools were working great economy in the management of orchard and farm crops. The essential feature in all classes of cultivation is to vary the tools to the soils used. The 18-inch disc pulls easier, but it was thought the 13-inch disc does finer and better work. One recommended an eight-foot cutaway going each way, chipping the soil, leaving it in chunks; would work equally well in dry or wet soils. A new disc harrow hung on wheels with a dropping attachment was a candidate for favor. The ordinary turning plough should have no place in the orchard only as a matter of necessity with blue grass sod. Trees in that condition have the roots near the surface, when it injures them to plow. It was suggested the better plan

would be to kill the grass with good stock manure used as a heavy mulch, especially where the trees were too close to give a very shallow ploughing.

The next paper on the program was on "Transplanting the Apple in the Northwest," by Secretary A. W. Latham. This paper brought out a very full discussion. The paper was very instructive and included the experiences and methods of some sixteen planters in Minnesota and Iowa. It is hoped it will be printed in the Minnesota Horticulturist.

The next paper was by Oliver Gibbs, of Prescott, Wis., on the "Variation of Fruits in Changed Environments," Altitude had much to do with changing late summer to early fall, and late fall to winter varieties. Elevation, soil and climatic environments were making decided changes. Some varieties had a wonderful amount of adaptability to changed conditions. The Utter is one that varies as much as any variety known, often specimens from the same tree show a wide variation. The Peter, Wealthy, Plumb's Cider, Wine Sap, Ben Davis and others have this inherent power of variation under changed conditions. The Fameuse will do its best on a sandy loam. It does not thrive as well on stiff clay. The native sand cherry responds quickly to environment. The Wealthy seems wonderfully well adapted to changed climatic conditions. It is now planted all around the world. This question was very fully discussed. Mr. Luther Burbank's tree grafted with over 600 varieties was spoken of as a case where conditions were made as near alike as possible. Mr. S. H. Kellogg had twenty-five varieties on one tree. Mr. Smith spoke of a peculiar variation of a Whitney tree: on one limb the fruit was mostly of a larger size than on the balance of the tree. It was claimed that a soil with a large amount of silica often in different seasons will change coloring and season of fruits.

EVENING SESSION, TUESDAY.

"Stubborn Facts in the Forty-Second Latitude," by W. J. Moyle, Yorkville. He spoke of the diverse locations, changeable climates, variation of soils that had to be met in the cultivation of fruits. Often adverse conditions required heroic changes in methods and varieties. Still he had unbounded hope in the future for fruit culture above the 42d parallel of latitude. One great drawback was the methods often used in the propagation of nursery stock. Western propagation was not similar to eastern in many respects. Often nature employs those methods best adapted to climatic conditions, and we ought to be careful and not make too marked a change from nature's laws. The native plum should al-

ways be propagated on its own roots. There are some varieties that can be propagated by working on crossed species. Kieffer pears on short pieces of apple roots, using long scigons, will root from the scion. The wild native crab was susceptible of marked changes, and the raising of seedlings should be encouraged. Thought the state society should offer a premium for improvement in our native crabs. They often brought $1.00 per bushel, to be cooked with others to give aromatic flavors.

The paper by Mrs. Franklin Johnson, "How to Keep the Girls on the Farm," was full of sharp practical suggestions. She read many very interesting letters from farmers' daughters. One said: "Give the girls something to do. An interest in the poultry yard, or certain plats of fruit should be put under their care and management. Then they will gradually fall into the way of caring for and become interested in the belongings of the home and farm—something belonging to herself." Many tire of the farm through misdirected education. Truly, idleness breeds discontent. She should be a trained mistress of all farm life among congenial friends. The system of constant drudgery has often turned the girls from the ways of the farm. No isolated farm should be without its telephone—this for economy and sociability. It is as well adapted to farm life as to city business. Educate your girls from earliest childhood to take an interest in rural development and good magazines and papers, not that class of yellow covered, trashy stuff that always leads away from the enjoyable features of home and real friends.

"Fathers and husbands, if you want to keep the wives and girls on the farm, you must spruce up; wash your buggy now and then, change your clothes and not go in the working garb of every day life when you go to town with the wife or daughters, dressed for the occasion. The contrast is too perceptible."

(To be continued.)

Good Words for The "Horticulturist."—"We feel we have had many times our money's worth from your magazine and have taken great pleasure in passing it along where we thought it would be read."

"The magazine has been of great use to me."

"I have not the slightest idea of dropping my membership in the society; it is too good a thing.

"The Horticulturist has been a great help to me the past year."

"I receive a great deal of pleasure and profit from your little magazine."

"I get lots of helpful hints from the monthly magazine."

SPRAYING AND SPRAYING MATERIALS.

R. S. MACKINTOSH, ASST. HORTICULTURIST, MINN. AGRI. EXPERIMENT STATION.

The spraying calendar is only a reminder of what is to be done if the plants are in danger of being attacked by insects or fungous diseases.

Poisons like Paris green, London purple, etc., kill only when taken internally by the insects; hence are of no use in destroying "sucking" insects, as plant lice. Kerosene emulsion, or kerosene and water, are used for soft-bodied insects, as plant lice, and kill by contact. Copper sulphate is used to prevent the spores of fungous diseases from growing on the surface of plants. It is dangerous to apply it when plants are in leaf; hence it is mentioned in the calendar to be used only before the buds start in the spring. Bordeaux mixture is made of copper sulphate (blue stone) with lime added to prevent the copper sulphate from injuring the foliage. It is useful only when applied in time to prevent the spores of the fungous disease from growing. It is necessary then to keep the foliage and stems covered with the Bordeaux mixture during the time the spores are spreading.

The materials should be applied in as fine a spray as possible. To do this a good strong force pump is necessary, and a simple nozzle that will break up the solution into a mist-like spray, and hose and piping to carry the material easily to all parts of the tree. Do not try to work with only a short length of hose—the work cannot be done well enough, and if not done well it is time and money wasted. The pump should have a brass lined cylinder, and it is preferable to have one that has the cylinder in the liquid, as in the barrel, and also arranged so that it can be quickly taken out to be repaired when necessary.

An agitator to keep the mixtures mixed properly is very essential.

Bordeaux Mixture.—Copper sulphate (blue vitriol), 5 lbs.; quick lime, 5 lbs.; water, 50 gallons.

Dissolve the copper sulphate in a wooden or earthen vessel, either by suspending it in a sack near the surface of the water or by using hot water. When dissolved, dilute with fifteen gallons of water. The lime should be of best quality, free from grit and not air slaked. Slake it with hot water by adding enough water to keep it from burning. Dilute with fifteen gallons of water. When ready to use, pour the two solutions together through a wire

strainer into the pump barrel containing twenty gallons of water. Stir constantly and for a few minutes after the materials are all in. It is not safe to use this unless it has been tested to see if there is an excess of lime. A convenient way and one that is fairly accurate is to take a small amount of the mixture in a saucer, hold it up near the mouth and blow into it. If a thin coating (scum-like) forms on the surface it shows that the lime is in excess, and it is then safe to use.

Copper Sulphate Solution.—Copper sulphate (blue vitriol), 1 lb.; water, 15 to 25 gallons.

Dissolve the copper sulphate as described under Bordeaux mixture. This is only used on dormant plants, as before the buds start in the spring. Use the weaker solution on the plum.

Potassium Sulphide Solution.—Potassium sulphide, 1 oz.; water, 1 to 3 gallons.

For mildews on gooseberry, currant, and for chrysanthemum rust. This is easier to use than Bordeaux and for mildews works very well.

Paris Green; London Purple. Paris green or London purple, 1 lb.; water, 75 to 200 gallons.

It is advisable to add a little milk of lime to prevent the injury from any free arsenic which may be present in the poisons. It is dangerous to use these poisons on the plum.

Hellebore.—Hellebore (fresh white), 1 ounce; water, 5 gallons; or, hellebore, 1 pound; flour, dust, etc., 1 pound.

Flour helps to hold the hellebore or Paris green on the foliage. This should be used when the dew is on the plants.

Kerosene Emulsion—Formula: ½ lb. common bar soap, 2 gallons common kerosene.

Cut the soap into small pieces or shavings and dissolve in about two gallons of hot water. While still hot, pour in the kerosene and with the hand pump or syringe pump it back and forth until a thick butter-like substance is formed. In this condition the kerosene is divided into very minute globules and will be readily diluted or suspended in water.

Before using, add water enough to make (A) 10 gallons of emulsion or (B) 20 gallons of emulsion.

(A) is to be used when the insects are in large numbers and the foliage is known not to be easily injured by it.

The potato scab may be largely prevented by planting clean seed, and even diseased seed may be used provided it is treated as indicated herein. When the seed and soil is free from the scab germs, the crop will be free from scab.

Treatment with Corrosive Sublimate. Dissolve one ounce corrosive sublimate in hot water, in wooden or earthen vessel. When dissolved add water to make up to 7½ gallons. Put potatoes into sack and submerge in the solution in the barrel. Let soak for 1½ hours. As this is a deadly poison, great care must be taken that none is taken internally. This strength is not at all harmful to the hands.

Treatment with Formaline. Formaline is not as deadly a poison, hence is safer to use than corrosive sublimate. Pour the 4 ounces of formaline into 7½ gallons of water; follow directions as above as to time and method of treating potatoes.

SPRAYING CALENDAR.

APPLE.—Codlin moth, tent caterpillar, canker worm, curculio.

First Application.—For aphis spray with kerosene emulsion before buds start.

Second Application.—Paris green when flowers have fallen.

Third Application.—Paris green 8 to 10 days later.

CABBAGE.—Worms.

First Ap.—Paris green and flour.

Second Ap.—Repeat as often as needed.

CURRANT; GOOSEBERRY.—Mildew, worms, borers, leaf spot.

First Ap.—When pruning cut out all canes infested with borers. As soon as worms are seen, Paris green or hellebore.

Second Ap.—Repeat if worms are bad. (For mildew use potassium sulphide.)

Third Ap.—If worms persist, hellebore. Do not use Paris green when fruit is nearly ready for use.

Fourth Ap.—After fruit is gathered, Bordeaux for leaf spot.

GRAPE.—Rot, downy mildew, flea beetle.

First Ap.—Before buds start copper sulphate.

Second Ap.—When leaves are half grown, Bordeaux and Paris green.

Third Ap.—When fruit has set, Bordeaux.

NURSERY STOCK.—Fungous diseases.

First Ap.—Copper sulphate before buds start.

Second Ap.—Repeat at intervals of 10 to 14 days with Bordeaux.

PLUM.— Curculio, rot, black knot, leaf blight.

Second Ap.—Cut out and burn all black knot whenever seen. Spray with copper sulphate before buds start.

Second Ap.—Jar trees for curculio when in flower and continue for several days after.

Third Ap.—When blossoms have fallen Bordeaux.

POTATO.—Beetles, scab, blight.

First Ap.—Soak all seed in corrosive sublimate solution, using 2 ozs. to 15 gallons water for 1½ hours.

Second Ap.—For beetles use Paris green either with water or

with flour.

Third Ap.—For blight, Bordeaux when plants are 6 inches high and continue every two weeks.

RASPBERRY; BLACKBERRY.—Anthracnose, red rust, snowy tree cricket.

First Ap.—Cut out and burn all canes affected with galls, snowy tree crickets and badly diseased with anthracnose. Spray with copper sulphate before buds start.

S econd Ap.—When new canes appear, Bordeaux.

Third Ap.—Two weeks later repeat.

Fourth Ap.—After crop is gathered cut out all old canes and spray new ones with Bordeaux.

Fifth Ap.—If red rust appears cut out and burn all plants affected.

STRAWBERRY.—Rust.

First Ap.—As soon as growth begins, Bordeaux.

Second Ap.—Bordeaux when blossoms open.

Third Ap.—When crop is gathered mow and burn all foliage to destroy leaf rollers as well as rust.

Fourth Ap.—All new plantations should be sprayed with Bordeaux twice if rust is feared.

ONIONS BY THE ACRE.

ALTON M. SHEPHERD, MINNEAPOLIS.

Our paper will be a simple resume of our experience in growing onions in the old "North Star Gardens," that were located at Hennepin avenue and Nineteenth street, on Lowry hill, in our city, where, for a period of about ten years, beginning in 1876, we grew annually from two to four acres of onions. which commanded at that time an average price of not less than $1 per bushel. We have sold as high as $2 per bushel, and an acre produced with us from 600 to 800 bushels, usually nearer 600 bushels. Our soil, and lay of same, was very good, being nearly level, slightly undulating, and a heavy black loam, retaining fertilization and moisture well, and with due care not lumping in early cultivation; at the same time it did not allow of standing water after copious rains. We never plowed our onion plat after the first year, during the period of its cultivation. We cultivated it deeply and thoroughly each fall, and then in the spring, just as soon as it would do to work (have even removed drift of snow to facilitate drying), we cultivated again, and then applied a liberal dressing of hen manure, wood ashes and well rotted stable manure; then cultivated, dragged, and planked it again thoroughly—with the emphasis on the word "thoroughly."

We always procured our seed early, of reliable growers only, and tested its vitality. Here is one of the strongest points of suc-

cess, viz.: "The best seed that can be procured," regardless of a little extra cost. We never were bothered with scullions. Having such seed we began sowing immediately after the soil was prepared. We used a hand marker, marking several rows at a time, twelve inches apart, running preferably north and south, and starting drills at the same time marker was started. We used both the Planet, Jr., and Mathews drills, sowing seed about three-fourths of an inch deep, and a man following the seeders with a heavy garden roll. Just as soon after germination as we could see the rows of onions, we started the hand cultivators, using the hoes until the onions were about six inches high, when the cultivator teeth were used until the onions were laid by.

When from two to four inches high we began weeding the rows, using the loop weeders. In fact, when we had many hands weeding we made our own weeders, taking an old pail hoop, about one foot long, bending into a loop and winding the ends with cloth for a handle, and these, by the way, were fully as efficacious as those we bought. We have often, in an unusually rainy season, put on our rain coats and wed regardless of rain, picking up weeds and putting into baskets. We never allowed the weeds to get the start of us. If the weeds ever should get the start of the grower we would advise selling out the onion plantation to the first fool that would offer to buy such a plantation. We cultivated continually (especially in dry season) until the tops begin to droop, when it was discontinued.

When the tops were nearly matured, if green tops showed on the plantation we took a barrel and rolled it back and forth, breaking down two rows at a time. This finished operations until the onions were fully ripe, and the tops completely dry and ready for harvesting. In doing this, our method was different from that of any grower we ever noted. Instead of pulling first and topping afterward, the usual manner, we took sharp knives and cut, or, more properly, shaved, the tops before pulling, cutting two rows at a time. By this method we saved fully one-half the labor of topping, which is a tedious job. One who has not tried it would be surprised at the great saving in labor. The toppers were followed either by men with stiff brooms, who swept the tops into piles, or with close-toothed wood rakes, raking them into piles. These were removed in a one-horse wagon, driven in one row on one side of the plantation, and out on the same row at the other end. In this way not an onion need be bruised.

After the tops are removed, steel garden rakes are used to lift

the bulbs from the ground, throwing five rows into each windrow at the same operation. Here they are left until thoroughly dry, turning occasionally with a wood rake.

We usually sold our crop from the field, picking up and sacking from the windrow, being very careful to discard every onion not fully matured. By this mode of selling our expense of handling was reduced to a minimum, no small matter in handling 2,000 to 3,000 bushels, and taking everything into consideration we found one year with another that we were ahead on sales made from the field.

Of course we always stored a few hundred bu. for home trade. When we stored we brought our crates into the field and filled them, taking to the storehouse, where they remained until so cold that we were obliged to remove to the cellar. The longer they can be left in the storehouse the better. We tried one winter keeping a few hundred bushels by covering with straw in a loft, and keeping frozen till spring. With us it was not a success, the onions lacking the firmness, after thawing out, of those stored. We never practiced it. A dry cellar, as near freezing point as possible and not freeze, is an ideal place to winter the onion crop.

Our onion field was to us, when engaged in market gardening, always the most interesting and pleasing field in our garden farm. There is no crop that takes the eye of the visitor as quickly as a large and well kept field of onions, the beautiful dark green and perfectly straight rows almost merging into one at the far end of the field is a picture of symmetry and promise of bounteous prosperity not soon to be forgotten. And not the least interesting feature is the resulting well filled pocket, for "onions by the acre" pay!

GRADUATES OF THE MINNESOTA STATE FARM SCHOOL.—Mr. A. K. Bush: "In my travels about the state I met a large number of these farm students, and I thought how different it was with them when they reached home than with the average professional man when he goes out into his field work. We find they are not only helping themselves, but that the entire community is benefited by what they are doing. They do better farming, and they get better results, the whole neighborhood is leavened, and everybody is made better. Let one graduate from the school of medicine; he goes to his work in a field that is already filled with men as well or better qualified than himself, and it is usually a long time before his influence is felt in the community. We find it the same in other schools and professions. Let one go out from the divinity school; he is perhaps better equipped than others, and the others suffer by it. The student is better qualified to do his work, he does it well, others come to see it and to pattern after it, and the whole neighborhood is benefited."

Secretary's Corner.

MEMBERSHIP FOR 1902—Now (Mch. 20) stands at 1076. This is high water mark for the society—but we must go higher. Have YOU sent in a new member for this year yet?

HAVE YOU RECEIVED THE 1902 REPORT?—Most of the reports are sent to members from this office by express. If any member has received one bruised or injured in any way, by breaking down the corners of the binding, etc., the secretary would like to know of it, and how it was received, whether by express or by mail.

JARRING PLUM TREES FOR CURCULIO.—This to be successful must be done early in the morning. A sheet of some kind should be spread under the tree and then strike the trunk of the tree sharply with a padded stick. This causes the plum curculio and plum gouger to fall to the sheet, where they can be gathered and destroyed. R. S. MACKINTOSH.

"VEGETABLE GARDENING" REVISED.—This practical guide to the growing of vegetables in this climate, by Prof. S. B. Green, notice of the revision of which had place in the Secretary's Corner in the August number, has now appeared in its fourth edition, somewhat enlarged and largely re-written throughout. It is printed on fine paper, of a little lighter weight than its predecessor, and is sold now for $1.00. While written especially for a class book for the Agricultural College it is equally of value to every grower of vegetables Have you a copy? Apply to the Secretary.

"FORESTRY IN MINNESOTA RE-WRITTEN"—A new edition of this text book by its author. Prof. S. B. Green, practically written anew throughout, is now in press and will soon be ready for distribution. Being printed by the state, it will be sold at cost, 25c in cloth binding. On these terms the edition should be speedily exhausted, as it gives the very information needed by every one who has the planting or the care of forest trees on their hands, either in the shape of forest, grove, windbreak or isolated trees. The book can be had by addressing the author, at St. Anthony Park, or this society gives it away as a premium for sending in a new member. You should have it in some way!

DEATH OF SECRETARY MANNING, OF THE MASSACHUSETTS SOCIETY.—Robert Manning, for a long period secretary of the Massachusetts society, died suddenly at his home in Salem on February 17th and was buried there the 19th. Although of somewhat advanced age, being born in 1827, his health was very good up to the time of his death, and the news of it comes with great suddenness. As a working officer of probably the oldest and best endowed horticultural society in this country, Mr. Manning was very well and most favorably known. While the writer had no personal acquaintance with him, yet an occasional correspondence makes this loss seem very largely a personal one.

DEATH OF DR. M. M. FRISSELLE—Dr. Frisselle died at the home of his daughter, Mrs. Gilbert Von Ellen, 916 Chicago Ave., Minneapolis, after a very brief illness, on Tuesday, March 18th, at the advanced age of eighty years. Since 1889, except the last two or three years, the doctor had been a member of this society He was a man of considerable library attainments as well as a practicing dentist and an expert horticulturist. For some years he has made his home on a fruit place on the south shore of Lake Minnetonka, where he set a practical example of the good results following thorough and intelligent work along horticultural lines. The writer understands that only within a few days prior to his decease had he sold this place with the intention of claiming the physical rest to which his years and service entitled him.

MEADOW VALE HORTICULTURAL SOCIETY, ANNUAL MEETING, JAN. 10, 1902—Officers elected: Albert Heath, president; Chas. A. Hill, vice-president; F. J. Keasling, secretary and treasurer.

Delegates to state meetidg in 1902: A. W. Keays, Albert Heath, Chas. A. Hill.

After election of officers, A. W. Keays read a report of the trial station at this place, as he is superintendent of it, and exhibited some fine specimens of fruit, with remarks as to their merits and adaptability to this section. After this the report of the delegate to the state meeting was listened to and discussed.

Quite an interest is shown in horticulture in this section, and a good many plum and cherry trees are being planted, but not so many apples, although some trees are doing very well; but people are a little afraid to plant many apple trees. F. J. KEASLING, Secretary.

AN ENEMY OF THE APHIS—In the spring of 1901, after the leaves of the apple trees had opened I found the trees covered with aphis. I at once sent for a new sprayer, which was over two weeks in coming. I went into the orchard with the sprayer, primed ready for slaughter, but failed to find the enemy in numbers worth fighting, but on looking over the trees I found numerous small brown worms busy eating aphis. They seemed to prefer the small ones. They did no damages to the trees and finally disappeared. I also found the worms in Canada and Michigan in October eating aphis, although there were very few aphis to be found at that time.

The worm is about three-eighths of an inch in length, tapering at each end and quite large in the center of body; long, small, black head; the color is dull yellow and light brown; the back is a bright yellow, and along the back is a row of small brown spots, eight tufts of hairy bristles protruding from each side of the body. A. W. KEAYS, Elk River.

APPLE SEED FROM THE EXPERIMENT STATION—The apple seed sent out by the Experiment Station this year was saved from named varieties in the summer of 1901. It has been kept dry over winter and will need some especial care to assure its growing well this season. Perhaps the best way to treat it is to soak it in water over night, then mix it with moist sand and put out doors during the frosty nights of the early half of April. About the middle of April bring the seed into the house with the sand and keep in a warm room and stir from the bottom about once a day. As soon as seed starts it should be planted in light, rich soil. It is better to keep it in the house until it is started, as in this way a better stand will be secured than if planted at once in the open ground, where it will be liable to the attacks of rodents, and the baking of the soil over it may prevent its coming up well. Should cut worms be plentiful some provision should be made for surrounding the seedlings with a box six inches high. SAML. B. GREEN.

A WOLF RIVER TREE.

PATTEN'S GREENING.

THE MINNESOTA HORTICULTURIST.

VOL. 30. MAY, 1902. No. 5.

THE ORIGINAL PATTEN'S GREENING APPLE TREE.

[See Frontispiece.]

Through the courtesy of the originator, Chas. G. Patten, of Charles City, Iowa, we are enabled to present to our readers a half-tone engraving of the original seedling tree of this now widely known and generally planted variety in the northwest. In response to a request for its life history Mr. Patten says briefly:

"The seed that produced this apple was grown on the farm of Mr. Daniel T. Eastman, nine miles north of Portage, Wis., in the summer of 1869. While visiting in Wisconsin that fall, Mr. P. S. Eastman, his son, gave me two or three of the very finest Duchess apples that I ever saw, and from the seed of these came this apple. After seeing fully developed specimens of this apple, I became curious to learn more of its parentage, and learned from the Eastmans that diagonally across from this tree stood a Rhode Island Greening, which I have not the least doubt was the pollenizing parent, for I have seen scores of the Patten's Greening that no one could tell from outward appearances from the Rhode Island Greening, and it has the excellent cooking qualities of the latter as well as of the Duchess.

"The old Patten's Greening, shown in the engraving, was transplanted to where it now stands in 1874, at five years from the seed. For the first twelve years or more it was badly crowded with other seedlings and the Mary and the Wolf River apple trees, from Mr. Wm. A. Springer, as shown in the engraving. It has not been cultivated for ten or fifteen years, and never but little, and has been too much crowded by forest trees, and in earlier years was cut heavily for scions. The tree originally had three main branches, but when about three inches in diameter one of the branches was torn off by a stray animal, exposing the heart of the tree, which was

perfectly bright, showing that the terrible freeze of Jan. 8th, 1873, had not injured it at all. One of the branches about this time was top-grafted to the Wealthy, which bore three years, but was forced out by the greater vigor of the Greening, or perhaps for want of adaptibility between the two.

"The soil on which it stands is by no means well suited to the apple. So far as we can remember it has not failed to bear some apples for twenty-two years. It bore a good crop last year, and made a growth of from ten to twelve inches, and we expect it to bear a fine crop the coming season. It seems to be widely adapted to northern latitudes. Prof. W. M. Munson, of the Maine Experiment Station, says that it is doing exceptionally well in northern Maine. The winter of 1884-5, that killed a good many Duchess trees completely and killed spurs and branches on other trees, left the Patten's Greening less injured than the Duchess on my grounds, with but a single exception." Sec'y.

CULTIVATION OF THE COMMERCIAL ORCHARD BEFORE AND AFTER BEARING.

ROY UNDERWOOD, LAKE CITY.

It has come to be a maxim of horticulture that "cultivation conserves moisture" and is, therefore, a practice that is, in some degree, necessary to fruit growing. Other preventives of evaporation are put into use, it is true. Mulches are employed, and the need of groves to break the force of the wind has been demonstrated. The fact remains, however, that the condition of the surface soil affects more than anything else the escape of moisture.

It is purely a question of capillary attraction, and a parallel example may be observed in an ordinary lamp wick. When the end of the wick is kept clean, the oil is drawn up rapidly and without hindrance, but let a charred surface remain on top and the oil refuses to draw. The process of evaporation or capillary attraction has been checked by a condition on the surface which prevents the liquid from being drawn up to the flame.

In the orchard the sun and wind are the flame, the surface of the soil is the top of the wick, and the damp soil underneath represents the lower part of the wick immersed in oil. When the surface is smooth and hard the warmth of the sun draws up the water from the sub-soil, and once there it is hurried away by the wind. Now, if we stir this top soil, we produce what has been called a "dust blanket." The condition of the soil in the "blanket" is very different from that underneath. By the process of pulverizing, myriad

air spaces are placed between the grains of earth. This prevents the moisture from going through easily, as a large per cent of the capillary attraction has been destroyed, and the water cannot leap the air spaces thus created. This, in a few words, is the philosophy of cultivation as applied to the saving of the soil's moisture.

It is not within the province of this paper to call attention except in a general sense to the *importance* of cultivation in the commercial orchard. That has already been done emphatically many times. I will, therefore, not do more than to give a few diary notes on the subject that have come to my notice in the experimental orchards of the Jewell Nursery Co., at Lake City, Minn. Here, with nearly 5,000 orchard trees, both apple and plum, have been tested about all the general methods of cultivation advocated, and the present system of orchard cultivation, which I will outline, is in our estimation the best and most prolific of good results.

Distance to Plant Orchard Trees. In our Lake City orchards we are finding that in our first orchard plantings we made the common error of putting the trees too close together. In the early days of horticulture in this state the comparatively small size which the average apple tree eventually attained led us to believe that we should plant them close together.

Our first orchard was planted in rows 14 feet apart, with the trees 12 feet apart in the row. Now that we are awake to the necessity of cultivating this orchard, we are confronted by a grave difficulty in lack of space to run the cultivator. We discovered the possibility of this difficulty several years ago, and as a result put in our next large planting 16 feet apart each way. Then followed another 18 feet apart, and now we have by our added experience come to believe that 20 feet is none too far apart for a commercial orchard in Minnesota. In the small garden, where cultivation may be practiced on a diminutive scale, this is of course not necessary, as the trees themselves do not require that amount of ground.

Trimming and Pruning. A word might be said in regard to keeping the trees in proper shape to permit of easy cultivation. Orchard trees should be watched every year and not allowed to sprawl out in a decided manner in any one direction. While we advocate low branching, we at all times aim to keep a uniform head by balancing the branches on one side with complementary branches on the other. A little attention given to this question each season will save many steps later on, for you can now easily cut off branches with a pocket knife that will sometime require a saw if allowed to remain.

Cultivating the Young Orchard. Probably most northern horticulturists advocate using the spaces between the rows of a newly planted orchard for the purpose of growing some crop. If the process of cultivation is followed up and the weeds kept down continuously, there is no harm in this, provided all grass crops are strictly avoided. In our observation, however, we are inclined to think that unless the owner is particularly cramped for space, the best results are obtained by keeping the orchard clear of everything from the very start. Particularly is this true if he desires to bring his orchard into early bearing. It must not be forogtten that whatever is grown between the rows will take from the soil an amount of humus, nitrogen and other properties that would otherwise go into the building of the tree. It would, therefore, follow as a general conclusion that not only must a great amount of fertilizer be put back on the ground, but there is also lost a considerable time in bringing the tree to a bearing age.

Fertilizers and Mulches are features of orcharding so closely allied in results to the problem of cultivation that they should here have at least a passing consideration. In a young orchard on good land it is not always necessary to use any fertilizer, especially if the cultivation is kept up faithfully; but after the trees have reached a large size, and especially when they have commenced bearing, a small amount of stable manure spread around each tree, when the farm work is not pressing, will more than repay the owner in the size and quality of the crop, and also in the resulting growth of the tree. It is a simple matter of feeding the tree in the same manner as you feed your horse. During the winter, when the horse is doing very little or no work, he will live well on straw or other coarse food, but when you begin putting him in the harness for regular work, you are wise if you begin an immediate increase both in the quality and quantity of his food.

Apply this example to the fertilization of orchard land, and you have a good working basis upon which to act. Remember that by the time the trees are of a bearing age the soil so smooth and apparently devoid of life upon the surface is emmeshed by a vast network of fine fibrous roots reaching in every direction. The more you expect of a tree, the more you must give it in the way of material upon which to work. In many respects it is like a factory machine; the soil and the air furnish the raw material, and the fruit represents the finished product. It is your duty to see that all the cogs are in place and the journals well filled with oil; this is what you do when you cultivate to keep the moisture in the soil, and

when you mulch to supply the tree with the rich elements it annually absorbs in its crop of fruit.

Cultivation of the Orchard before Bearing. Supposing that the orchard has now reached an age where the majority of the trees are in bearing, the value and consequent necessity of cultivation is increased by the fact that the tree is now not only adding to its growth in fiber and leaf but is also throwing out a large surplus of its vitality in the production of a fruit crop. As soon as the frost is out of the ground thoroughly, and the new spring shoots begin to appear, cultivation should begin. Through the months of May, June and July the cultivator should be run over both ways at least once a week. The old rule was to cultivate after every rain. In the eastern states, and wherever the rainfall is generally regular and frequent, this rule is a good one, but here in the prairie country we have found that the early summer drouths to which this section is subject make it a rule that is not always safe to follow. Whenever it does rain, the cultivation of the orchard should follow immediately after, no matter when it was cultivated last. At no time is the evaporation so rapid as when the surface soil is thoroughly wet, and if we would retain all the moisture possible we must put on our "blanket" immediately, and metaphorically lock the barn before the horse is stolen. But in this latitude the rains are neither frequent nor regular, except in rare seasons, and our chief care is to hold the moisture down during the three, four, five, six and sometimes eight weeks of drought with which we are all familiar. It is during periods of this kind that the "dust blanket" has its greatest value, and experience in the Jewell orchards, at Lake City, demonstrate that this value is lost if the process of pulverization is not kept up with continuous regularity. The moisture in the subsoil is always coming toward the surface and naturally soaks into the "dust blanket," destroying in a comparatively short time its efficacy in holding the moisture down. The necessity of constant cultivation is thus easily seen. After the middle of August we generally leave the soil alone, except in case of a rain, when a light cultivation is given, care being taken not to jar the trees.

Weeds. A word should be said about weeds and grass in the orchard. The thoroughness of cultivation which we advocate would not give them a chance to start. We do not allow one spear to show its head in our orchard, and this is a rule that should be followed. Never let them get a start. If you are beginning cultivation on new orchard land, where the weeds have already obtained a foothold, stamp them out with unrelenting vigor. Tenacious weeds and plants should be pulled up by the roots and carted out.

In this connection, I might say, never plant a blackberry root in your garden or orchard or, in fact, any place where you may want to cultivate. They are one of the most difficult things to exterminate, especially the hardy varieties.

Cultivation after the Crop Has Been Picked.—In some sections where the autumn season is long extended, with alternating warm, wet weather and cold spells, it is not a good thing to continue cultivation after the harvest of the crop. Our experience in Minnesota, however, has proven that the opposite rule should apply here. Fall weather in this latitude is decisive, and when it comes it is with sufficient severity to check the growth of the tree in time to prepare it with well-ripened wood for winter. Only a few times in our 33 years' history of orcharding at Lake City do our records show that trees have gone into winter with wood insufficiently ripe. Our policy now, therefore, is to renew cultivation as soon as the crop is off and there is no further danger of jarring the apples from the tree. There is considerable growth made by the tree during this time, especially if the season be favorable, and as our growing season in the north is very short, it is a decided advantage to give the tree all the growth possible while the warm weather does last.

Implements. The chief requisites for a cultivator to be used in the commercial orchards are three in number: 1. A cultivator that will cover the ground with the greatest possible rapidity; (2) one that will go as near as possible to the tree without injuring it; (3) a construction that will pulverize the soil to its greatest degree of fineness. This is a question regarding which there is a great amount of discussion, and we have no doubt but there are a large number of cultivators made that perform the service equally well when handled properly. We have tried many makes and have invented several ourselves. A cultivator that will work with two horses is a necessity for large orchards, as a one-horse implement will not cover enough space, and the time of the driver is wasted. At present we are using a large spring tooth cultivator, such as may be obtained at almost any farm implement house. This is arranged with levers to regulate the depth by lifting the teeth out of the ground when necessary. It is made in two sections and we have rigged up a long evener, to which we attach one section at each end, which causes them to work out under the branches next to the trees, while the team travels in the center of the space between the rows. After going through the orchard once in this manner we replace the long evener with the short one, which brings the two sections together, thus covering the space not taken in the first time. By going through the orchard in this way, and then crosswise once,

we find that we can put the soil into a very fine and powdery condition, even after a severe rain. We have also used with good success a common farm drag. In fact, any implement that will pulverize the soil to the depth of two or three inches is well adapted for the commercial orchard, provided it is an arrangement that will not injure the bodies of the trees.

Mr. Richardson: In our section of the country either the farmer is too busy, or there is something else; we have no commercial orchards. Sometimes a man sells over $1,000 worth of apples, but he does not cultivate. Two years ago Mr. Biddle was in our vicinity. I took him out and showed him the orchard. I don't know when it was cultivated. Mr. Biddle was very much astonished; he did not think it was possible to grow such trees in Minnesota.

Mr. E. G. E. Reel: Mr. Underwood brought up a point upon which I would like to have a little more information, and that is, in regard to keeping the ground clean. The matter of humus comes up, and I would like to know whether to provide humus we should not have a catch crop. Prof. Green, I suppose, could tell us what to use as a catch crop that would take the place of a fertilizer or supply humus.

Prof. Green: This matter of cultivation is an exceedingly interesting one, and one that has many sides to it, because there are so many conditions we must take into consideration. I attended a meeting of the American Pomological Society, at Buffalo, in September, and there a man of wide experience said he did not believe in cultivation for the orchard. Now, that seemed a strange kind of a doctrine, and a half dozen pitched into him right away. He said they never had a failure in Canada due to drouth. They did not need to cultivate to save moisture. They have forty inches of rainfall where we have from eighteen to twenty-eight. When it comes to cultivating in this section, you all know that when a piece of land is just broken up, a piece of prairie sod or a piece of newly cleared land, it does not wash when the timber is first taken off; but after four or five years' cultivation it will begin to wash, and it will wash a good deal, and the longer you cultivate the more it will wash, especially where there is a clean crop, and you can leave nothing in the soil. In English agriculture they call grass crops "ameliorating" crops, that is, improvement crops. They improve the soil in this way, that they add humus to it. Humus is not a food, but it has the power of absorbing gases and retaining moisture to a wonderful degree, and it is that quality that makes your soil friable, and it is to add that to the soil that we seed our land down to grass every once in a while, for I believe in the clean cultivation of the soil for just the purpose that Mr. Underwood has so nicely explained. I would say this, that there are some soils, and, I think, most soils in this state, that will not stand cultivation year after year without getting into a kind of mineral condition, and it is a good plan to seed down once in a while to one of those ameliorating, or improvement, crops that will add humus to the soil. I do not believe there are many soils in the state that can be kept in

good, friable condition if they are only cultivated; so I believe it is desirable to have a cover crop, and one of the good things for that purpose is clover. I have used buckwheat sometimes. I have cultivated until the latter part of June and seeded it down to buckwheat, or have waited until the middle of July and sowed to oats. Of course, it takes moisture out of the soil, but you have got to add something in the way of humus. In the eastern states some use clover, because they get nitrogen in the soil as well as humus. Buckwheat is a good crop, because it keeps the soil moist under it. Clover is good for the same reason. I had rather not do it in the spring, because it is necessary in order to get moisture in the soil to get the most out of our rainfall.

Mr. Pond: Will not straw supply humus?

Prof. Green: Yes, sir; that does very well.

Mr. J. M. Underwood: How will good rotten manure do?

Prof. Green: That is good.

Mr. Underwood: Is it not true that anything that will produce a cover crop for the soil will take up the moisture and defeat the object you have in view, supplying the orchard with moisture.

Prof. Green: It is an objection, no question about it. It is a crop that takes the moisture, and I think that is a serious objection.

Mr. Underwood: I have sown buckwheat and watched the results of buckwheat on the soil, but it will not do. There will be enough moisture to develop the buckwheat, but it takes all the moisture out of the ground; the ground is as dry as bone, and you cannot find any moisture anywhere. If you had not put the buckwheat on and had cultivated every little while you could find moisture within an inch of the surface, but with the buckwheat you could go right through the field and not find moisture within eighteen inches of the surface. Why defeat the purpose for which we are working by putting into the soil that which may add humus but will take all the moisture?

Prof. Green: It would be better to add humus in the shape of straw or manure than by any cover crop. However, not everybody has the manure.

The President: Put on your manure about the time the trees ripen their wood.

Spraying Cucumbers.—The L. I. pickle growers begin spraying with Bordeaux mixture about July 15 and keep it up at intervals of 8 to 10 days till frost.

THE POSSIBILITIES OF COUNTRY HOME GROUNDS.

MRS. O. C. GREGG, LYND.

In giving my few thoughts on this subject, I would like to preface what I say by assuring you that I do not propose to instruct as an artist nor direct as a scientist, but merely suggest and inspire, as I may, along lines which would make possible better things in country home grounds.

That much may be done to beautify the landscape by making more attractive the grounds of those who possess the land goes without saying, for in this regard our country, even under best conditions. is far from having reached the point of perfection. Indeed, it might be said to be but little past a good beginning. The improvement of country grounds is as necessary to the advancement of our commonwealth and nation as those of the city. Art and science may even go farther here than within the narrow limits of the city.

The Creator has done marvellous things in supplying man with that which is beautiful, grand and sublime, but there is much that He has left for man to do and much not to do. Nature has done so much for some grounds that man has only to adjust his buildings in such a way as to turn all to good account,—filling in here and there, it may be, to make an harmonious whole; but on prairie lands man is left entirely to himself, and too often he does the thing easiest to be done, plants a row of trees. This is better than nothing, but can we not do a little more thinking and add variety as well. An outline need not be always straight. Irregular and curved lines are more pleasing, for they are more varied, and the eye does not become weary with looking.

Minnesota has done much of planting in rows, and there are two good things to be said of this method,—it is neat, and the young trees can be easily cultivated. But can we not combine with this something that will be more pleasing, something like the English copse, which softens so beautifully the angularities of the landscape? In some instances it might be well to scatter bushes at different distances and in different numbers inside a hedge to break the monotonous straight line as one's eye takes in the beauty of a lawn or meadow. I remember more than one instance of seeing in my childhood some grand old trees in the middle of a meadow—and, if I remember rightly, they were nut trees, beech trees, I think—a thing to make a picture of, with cattle or sheep resting beneath their cool shade in the heat of summer.

We are told that it is our duty to be in harmony with our environment: of course, that alludes to higher things, our social en-

vironment. But we have other environments, and can we be in harmony with that which does not suit us in that which is immediately about us? Can we be in harmony with what offends us? There is one way to do this, and that is to have it in harmony with ourselves, make it what we would have it be. Make it so that our ideas of beauty and grace will not be offended. If a thing does not suit us, let us study it till we can make it better, at least. There is no true reason, all things being equal, why our farming districts may not be the fairest and most prosperous in the world. An artistic touch here and there softens the angularity of a corner or beautifies a desolate or unsightly spot, and this is left for man to do. Trees, shrubbery and vines are very effective here. If I were to have my choice between them and spacious buildings, I would by all means choose the living, growing, ever varying trees and shrubbery. An unpretending home with these is always attractive, while a stately mansion without them, though it may have grouped about it many outbuildings, appears bleak and uninviting.

Then there are other obligations than those belonging to ourselves, those belonging to our neighbors and to the public in general. How many think as they lay out their grounds that they are planning one of the homes of the nation. I fear that there are comparatively few who have with them the thought that they are making the homes of the nation or that the nation can be blessed by them in any way. They forget that no man liveth to himself and that each may bless his brother. This is a higher thought than pleasing self and self-aggrandizement, and if each would think of doing something worth while for the grand whole they would be truly patriotic in their work.

In thinking of the possibilties of country grounds we are brought to consider at once our ability and our surroundings, for our ability is the limit of things possible, and our surroundings may vary indefinitely. There is also a diversity of taste which would lead one to choose a home in one locality and another in a place with quite opposite surroundings. Some would not be satisfied without a lake view, while others would prefer broken or picturesque scenery. Again others delight in the even prairie.

We in Minnesota have much in our favor, for we are near the beginning of things. We can begin well if we study well. It is never best to commence work without due consideration. Let us plan first, and if our trial plan does not seem the right one after looking it well over, let us plan again and again, too, if necessary. Perhaps many will say, 'but I cannot go far just now. Shall I wait

till I can go on?" We would answer: Do the first thing now and do later things by and by. Put in your shelter belts and plant trees where you know you will want them, and study well this outline. Plan for forestry, orchard, berry patch, garden and lawn. Take a long look ahead. Plan as largely as consistent, for you will grow as the years go by. Study perspective and the science of landscape making, and year by year your home will grow into a thing of beauty. Do not shut in the house from the sunlight, but make it the center of attraction,—a thing of beauty in itself, if possible. Study the artistic in building. It is something to be thought of most surely, and so are order, neatness of appearance and cleanliness. Consider well the drainage of your house and lands.

In laying a garden *be generous,* but do not attempt too much. Do not overload with too great a variety of things in a small space, but rather give good opportunity for growth and easy cultivation.

Just here I will give a prescription which a doctor once gave to a country patient who asked what would be the best disinfectant to provide for hot weather. The doctor promised a prescription if he would get it filled and use it. This agreed to, it was written out as: "Rake, 1; shovel, 1; wheelbarrow, 1. Directions: Use vigorously every twenty-four hours until relieved. This prescription always works well."

We have said but little of the flowers, the flowers that beautify and bless. Let us have them in abundance, from springing grass to winter frosts, and let us learn to put them where they will do their best for us. Let us have a few rows in the kitchen garden for home decoration and to give away, so as not to rob the beauty of the parterre if we have one.

> Plant them, attend them, love them well;
> There shall be wrought a magic spell
> If you them safely guard.
> Who works and waits and watches may
> A glorious harvest see some day.

And this harvest will be not only the wealth of beauty which we will gather but the good they will do ourselves and others, for flowers have still, small voices, and they teach many a lesson.

Let us also think of the highway for a while. Should *it* not be kept in good order, free from weeds, at least, and well sodded if possible. It is a delight to drive on a road thus cared for.

Let us think, learn, act! Life is short! Let it be well improved!

If we cannot do all we would, we can at least have good seed thoughts for another generation. Goethe says:

"Each after all learns only what he can,
Who grasps the moment as it flies
He is the real man."

And let us keep in mind what another has said: "Success in life is a matter not so much of talent or opportunity as of concentration and perseverance."

STRAWBERRIES BY THE ACRE.

THOS. E. CASHMAN, OWATONNA, MINN.

Most people look upon this as an extravagant use of the term. The idea of growing a whole acre of strawberries seems to them to incur an inconceivable amount of labor with small recompense. But to the professional strawberry grower an acre of strawberries is no more than an acre planted to potatoes, for they require but little more labor and, as a general thing, are three times as profitable.

To obtain best results several things are required:

1st. Good land that has natural drainage and is retentive of moisture.

2nd. A good home market that can take all berries raised or access to other towns that are not yet overloaded.

3rd. Nearness to a good town, so that pickers can be secured on short notice.

All these things are necessary for the successful growing of "strawberries by the acre."

Most any good land suitable for growing corn and potatoes will give good returns if planted to strawberries—to be sure, the richer the land the greater the reward. If a person should look for an ideal place, he should choose a "sandy loam" that works easily and yet is retentive of moisture, and if not already rich it can be made so by a liberal supply of manure from the cow barn, put on the year before. It should be sown or planted to some crop that is not hard on the soil, and one that can be removed not later than August 15, as the ground should be plowed about that time, so that weed seeds that may be in the ground can germinate and perish when frost strikes them. It is a good policy to run the drag over the ground two or three times during the fall, so as to pack the ground solid.

As soon as the ground is in a condition to work in the spring, go over it with a disc harrow and work as deep as the plants are to be set, then drag it smooth and begin setting the plants. It is best

not to work the ground any faster than the plants can be set; at any rate not more than one day ahead.

As soon as the plants are set the cultivator should be started, so as to keep the surface loose and to nip off any weeds that may appear. The hoe is a very useful tool in the strawberry field in keeping the ground loose and free from weeds. If the season is dry the cultivator and hoe must be kept going to hold the moisture, and if wet to keep the surface loose and dry as well as to keep down weeds. When plants are set for fruit they should be arranged so as to insure pollenization. I find that alternate rows of Bederwood and Warfield, set sixteen inches apart in rows and four feet between rows, give excellent results. If all staminate varieties are planted, such as Bederwood, Splendid, Enhance, Lovett, Clyde and Parker Earle, they can be set separately or in successive rows, as they are all self-fertilizers. The varieties I have mentioned give the best results with me, whether planted for home use or for the market. The Parker Earle should be planted on low ground that has good drainage, and if this variety gets plenty of moisture it is a "world beater."

As soon as the runners are well started the joints should be pushed down in the ground, especially after rains, so as to help them take root and form new plants. They need all the help they can get, especially in dry seasons, but the rows should never be allowed run together, and can be kept from so doing by running the cultivator, which should be adjusted to about the width of sixteen inches and should be run through every week or so during the early fall, always going the same way through the rows, so as to keep the runners all running the same way. To obtain the best results the blossoms should be picked off the season the plants are set.

As soon as the ground is frozen hard enough in the fall to hold up a team, a liberal supply of straw, grown on land free from foul seed, should be placed over the rows and allowed to remain there until the plants begin to push their way through in the spring, when it should be removed and placed between the rows. This straw will help to hold the moisture, keep down weeds, prevents the rows from running into each other and furnish paths for pickers to walk on. The longer the straw is left on in the spring, the less liable the blossoms are to get pinched by frost, but it must be removed as soon as the plants start to push their way through. Should there be danger of frosts after the plants are in blossom, this straw between the rows can be spread back over the plants again and by so doing protect the blossoms from injury, but it must be removed as soon as danger of frost is over.

With the exception of protecting the blossom from frost each year and giving the plants winter protection by mulching with straw, the bearing strawberry patch needs but little attention until the fruit begins to ripen, with the exception of dry seasons, when it is sometimes necessary to irrigate. This may be done in various ways with more or less expense, and the best way seems to be by having a deep well placed near the strawberry field with a windmill and an elevated tank, or some might prefer a gasoline engine to force the water into the tank, which can be conveyed to the rows through pipes or rubber hose. Some people are lucky enough to have their strawberry field near a running stream or lake. If that be the case water can very easily be forced to the ground by means of a gasoline engine. With us in Owatonna we have access to the city water works, which is quite expensive and slow, but will answer the purpose if the plantation is not too large.

As soon as the crop is harvested the patch should be mowed over and raked off, and then a drag tooth cultivator should be put to work on the patch and about two-thirds of the plants torn out. After a proper tearing out of the plants, the patch will not look much like a strawberry bed, but what plants are left will runner out and form new plants, and before the season closes, if it be not an exceedingly dry one, the bed will be as thick as ever of nearly all new plants and will be ready for business the following year. If the strawberry patch is treated in this manner each year, profitable crops can be grown a number of years without changing the bed.

Mr. W. E. Fryer: What are your most profitable varieties?

Mr. Cashman: The Bederwood and the Warfield planted in alternate rows give the best returns. I like the Splendid, also the Enhance. We have had a little experience with the Clyde, but not as much as with others. All we know of it is that it is a good fruit.

Mr. Paul Burtzlaff: What are the shipping qualities of the Clyde?

Mr. Cashman: I have never shipped any of them, but they are quite firm:

Mr. R. A. Wright: Just a word in regard to putting the ends of those runners in the ground. It seems to me it would be an endless labor to treat an acre of strawberries in that manner. It would keep a man busy all the time and make a very expensive piece of work, especially as the condition of the soil was this last season.

Mr. Cashman: I find it is but very little work to push those ends down while the boys are hoeing the plants. We use the hoe a great deal in our strawberry field, and when we find a joint started we push it down into the ground and as soon as a rain comes it takes root.

Mr. Wright: I think they grow thick enough without going to that trouble.

Mr. Cashman: Well, if we had not had plenty of rain they would not have been thick enough.

The President: I understood it was only one or two varieties that did not runner well.

Mr. Cashman: No, I do it with all varieties.

The President: I understood it was only the Parker Earle.

Mr. Cashman: It is more necessary with the Parker Earle, because it does not runner well.

Mr. W. E. Fryer: How early do you plant in the spring?

Mr. Cashman: The earlier the better.

Mr. Fryer: What is the object in setting the self-fertilizing kinds separately?

Mr. Cashman: There is no object, only it is easier to keep them apart than it is when set with others.

Mr. T. T. Bacheller: In seasons of very vigorous growth in plants set in the spring, with an abundance of rain in the fall, is it necessary to pinch off the runners in the fall or can they be allowed full growth?

Mr. Cashman: My experience is rather limited in regard to those kind of seasons. The seasons in which I have had the greatest success have been dry seasons. The last five or six years it has not been necessary to pinch in any runners. We grow for plants as well as for fruit.

Mr. Fryer: I have grown strawberries very successfully and never did any pinching. The largest crop we ever had had large, hard berries.

Mr. W. B. Mason: Have you noticed any difference in raising plants when treated in that way?

Mr. Cashman: I have not found any difference the last three years. I find we cannot get too many plants in the ground, provided the rows are kept apart.

Mr. C. A. Sargent: In the treatment of the old bed would they not be dragged out in some places and left too thick in others?

Mr. Cashman: I use the Peter cultivator; that has a drag tooth form, and I find by going over the bed two or three times it removes enough of the plants.

Mr. Sargent: Do you not find in cultivating the second year it would take more off on the sides than it does in the center; does it not work the row together more?

Mr. Cashman: The party who handles the cultivator knows his business; he can guide it where it should be.

Mr. Sargent: The best cultivator I have ever seen naturally raises the rows a little.

Mr. Geo. Widger: In my experience I have had the best success in using a ten inch plow and a common drag, dragging the ground thoroughly. After the fruit is picked you cannot do too much dragging; you can go over it a dozen times. In dragging among the plants it covers a good many of them, but it is all the better for those that are left.

Mr. D. M. Mitchell: I have visited Mr. Cashman's nursery, and I think his idea of going over the bed in the way he does is a good

one. Last year was a dry season, and his stand was remarkable, also the amount of fruit he raised.

Mr. C. H. True (Iowa): I would like to ask the writer whether he has found any difference in the productiveness and vigor between the last formed plants and those set earlier in the season. This question was brought before our society last year, and there was quite a difference of opinion.

Mr. Cashman: It stands to reason that the stronger the plants the greater will be the productiveness. Take a weak plant sparsely rooted, and it will not produce as much as a strong plant well rooted.

Mr. W. P. Rogers: You cultivate one way so the runners will run one way?

Mr. Cashman: Yes, the runners will stay where they belong.

Mr. J. L. Herbst (Wis.): Talking about productiveness, it was stated, I believe, that those that were started first were more productive, but if you will take notice you will find that the plants on the outside of the row will produce larger fruit than those that are first set in the season. We want to find out why this is so. Berries will be larger on the outside rows than on the inside rows, and they will be larger on late set plants than on those set earlier.

Mr. Cashman: I find that true in my experience, and I find they are better in new beds, but there are one or two growers in Michigan who say the first few plants are the best. I think it is rare.

Mr. F. I. Harris: I have not been engaged in strawberry culture for the last ten years. I do not wish to criticize the paper, but I found, my land being rather heavy, by planting the rows five feet apart I got better results than by planting four feet apart, and I have no difficulty in getting the proper distance. I have a new field in which it would be impossible to go through the rows, and I planted them five feet apart but have not so many rows. That does not give too wide a row for the pickers by having one on each side.

Mr. R. A. Wright: How far apart are the plants?

Mr. Harris: 16 inches.

Mr. Wright: Does it not make more work?

Mr. Harris: No, it is all right.

Mr. Cashman: In my experience I find with the berry pickers I secure to do this work, who are mostly little people, that if the rows are too wide they will lie over on the row, and if the row is very wide they will not get the berries in the middle of the row. That has been my experience. I would not wish to have the rows wider than two feet.

Mr. Wright: That is my experience exactly. Picking strawberries is very hard work, and when you reach over a couple of feet it stands to reason, at least it has proved so in my experience, that the pickers become very weary and will rest upon their elbows or will lie down and miss many berries in the row.

Mr. Harris: I think that depends largely upon the kind of pickers you have. I think the best pickers are those from eighteen to forty years old; they come to work, and they do not get tired, and their work is a great deal more satisfactory, and they will work better if they do not have to run all over the row to find the fruit.

If you have a wide row they will stay there and attend to business because it pays them to do so, but with children I think, perhaps, it would be better not to have the rows so wide.

Mr. Clarence Wedge: This point of assisting plants to take root is a matter of considerable interest, but there seems to be a difference of opinion in practice. I would like to see a show of hands of those who practice the method of assisting plants to make runners, and of those who do not think it profitable to take that trouble.

(A show of hands indicated that a proportion of about two in six practiced the method of assisting the plants to make runners.)

Mr. Wright: It seems to me you would get too many plants started during May and June if it is a wet season. I plant the middle of May and never assist the plants to take hold, but I have them plenty thick enough.

MARKETING FRUIT BY ASSOCIATION.

ROLLA STUBBS, BEDERWOOD.

Four years ago we organized ourselves into an association, under the laws of the state of Minnesota, for the purpose of disposing of our fruits under a better system than that of former years.

Our association's name is the Minnetonka Fruit Growers' Association, consisting of the farmers on the north shore of Lake Minnetonka.

The association's officers are a president, secretary, treasurer, board of directors and one general manager.

The majority of the fruit growers have for sale a general assortment of small fruits, which are inspected by the general manager when delivered at the depot and graded, every member receiving the same price per case for each day's shippings, regardless of the place of sale, making the average alike on each day's sales.

The general manager superintends the sales, looking after the fruit, and distributing it throughout the northwest, including St. Paul and Minneapolis.

Under this system the fruit is distributed to the retail and wholesale trade, and we receive much better prices for all fruit sold. Usually the expenses are 3 per cent each year.

Our sales the last two years on fruits by this method have been from seventeen to eighteen thousand dollars annually on small fruits. We estimate that with the present amount of small fruit set and what will be set the coming spring of 1902, there will be nearly 500 acres in small fruits in the town of Orono, Hennepin county, under control of the Minnetonka Fruit Growers' Association.

The demand for the fruit seems to keep up with the extra amount set each year. The names of the leading varieties of fruits used in red raspberries are Marlboro and Loudon, with Shipper's Pride and other varieties introduced; for black, Nemaha and Gregg; and for strawberries, Bederwood, Crescent and Lovett.

Each member of the association has a number, and the number is stamped on his cases. This makes it quite easy for the manager to keep an account of each member's sales.

I would recommend that wherever there are eight, ten or more farmers raising fruits for commercial purposes, that they would organize themselves into a co-operative association to sell and dispose of their fruit, for in so doing better rates on express and also better prices on fruit may be obtained, and they will also save largely on commission. One man as general manager can do better in selling than ten or twenty men selling the same, as the manager has more time to look after the prices of fruit and keep posted. Fruit growers are very busy looking after the picking and tending the fruit; hence, cannot have the time to devote to the marketing.

Mr. R. A. Wright: The general manager is supposed to inspect the fruit when it is brought in. How can he do that when the grower does not bring it in only about half an hour before train time?

Mr. Stubbs: Well, he cannot go through it all. He ought to have a helper to assist him. If there is any fault found with the fruit of members who are shipping they are docked.

Mr. Wright: How do you manage it when in the same shipment there is some fruit under grade?

Mr. Stubbs: Well, we don't find that very often. Sometimes there is a little difficulty in that way in rainy weather. In that case the fruit is all damaged alike, and that would only happen about in a day's picking.

Mr. Wright: I did not have reference to that so much, but some people do not bring in their berries in such good shape as others, and it does not seem right that those with good fruit should not get more for it. Do you have a first and second grade?

Mr. Stubbs: The general manager sees to that. If it is too poor for first grade, then it could not be shipped in the association's name.

Mr. Wright: Do they not go all together at the same price?

Mr. Stubbs: If there are some naturally off and not salable, he has to keep them separate and give them credit for it.

Mr. A. G. Long: Is it not a fact that when a grower has extra good fruit it helps to sell the poor fruit, and the man with the poor fruit gets just as much as the other?

Mr. Stubbs: Well, our prices run pretty much alike. We have never had any trouble yet.

Mr. Wyman Elliot: What do you do with the fruit of a man which is of a little better grade than his neighbor's?

Mr. Stubbs: Oh, the difference in the fruit is very little.

Mr. Elliot: Yes, but is that justice?

Mr. Stubbs: Well, it seems to be as near as we can get at it.

Mr. Elliot: That seems to be the question. There ought to be a difference made.

Mr. Stubbs: It is impossible, you can't do it. We have never had much trouble except sometimes when a rain comes, and then they are pretty near alike. The general manager looks after that.

Mr. Herbst (Wis.): We have a general manager to look after our fruit. We have refrigerator cars set on the track into which the fruit is loaded. There is a manifest made out for all there is in the car, and each grower gets what his berries will bring. If he has good berries he gets more for them. They do not get the same price all the way through.

Mr. Wright: We make sales through our general manager, and what is not disposed of has to go to the commission man. Each man has to get the same price as the every other.

Mr. Herbst: Oh, well, I should say somebody gets it in the neck in that case.

ANNUAL MEETING, 1902, SOUTH DAKOTA HORTICULTURAL SOCIETY.

LYCURGUS R. MOYER, DELEGATE, MONTEVIDEO.

The South Dakota Horticultural Society met at Sioux Falls on Jan. 21, 1902. Sioux Falls is finely located on the Big Sioux river, in the midst of a rich agricultural country. Pipestone creek, on which is situated the great pipestone quarry, celebrated in song and story, enters the Big Sioux river here. Sioux Falls is reached by five trunk line railways and is, without doubt, the most accessible railway point in South Dakota. Situated, as it is, so near the Minnesota border and in the heart of the great prairie regions, it ought at some time to be the home of a great interstate horticultural society, where there could be studied and solved the peculiar problems that confront the tree planter and fruit grower in the regions where trees do not naturally grow.

The South Dakota Horticultural Society, while not large, has many enthusiastic members. The society is especially fortunate in having Prof. N. E. Hansen for its secretary. It is easy to say that he is an enthusiastic horticulturist; but his enthusiasm is of the quiet kind that takes account of every obstacle in the pathway of success and which works early and late with tireless energy to remove or at least surmount them. Nansen did not drive the Fram into the ice pack of the Arctic seas with more determination in his

search for the North Pole than Prof. Hansen is showing in his search for the hardy root for the prairie apple tree. The station on the prairie at Brookings seems destined to become a sort of Mecca to which the prairie planter will ever turn to express his debt of gratitude.

The discussion on strawberries was led by Henry Hess, of Vermillion. He manures heavily, plows deep, cultivates often and after every shower. Keeps cultivator going until October. Covers with clean straw, removes it in the spring, cultivates and irrigates. He sets two rows of pistillates to one row of staminates.

Mr. Geo. H. Whiting, of Yankton, sets his strawberries in rows three feet eight inches apart. The second year he plows the ground away from the rows and levels with a cultivator. He mulches with stable litter after the ground freezes. President Avery uses clean straw for mulching. Mr. Soderberg, of Sioux Falls, uses rotted marsh hay. Prof. Hansen reported that he was growing eight thousand varieties of strawberries, mostly seedlings. He says: "Strawberries need much water."

In the discussion of the bush fruits, Mr. Harrington, of Sioux Falls, recommended the North Star currant for its "very rampant growth." The Houghton is still the best gooseberry with Hansen and Whiting. The Pearl is doing very well at the trial station at Brookings. Mr. Whiting arms himself with gloves and picks his gooseberries into a large dish-pan, leaves and all. He then runs them through a fanning mill to clean them. L. E. Hanson, of Viborg, is having good success in growing the native gooseberry.

E. D. Cowles, of Vermillion, reported that strawberries were doing well with him, but that the raspberry was a failure. Currants must be grown upon a north slope or else be mulched. He will in the future put his currants in his orchard. Gooseberries must be under trees. He is afraid of the Crandall currant, but speaks highly of the Russian oleaster as a hedge plant. The Juneberry does well, but the birds take all the fruit. The buffalo berry does well with him. The Rocky Mountain cherry is not so good as the South Dakota sand cherry. At Vermillion it blights.

Prof. Hansen reported that he had five hundred sand cherries in bearing. They are at home on dry upland prairie. He has great faith in its future. The sand cherry requires dry, arid land. Up among the sand hills of Nebraska they think sand cherry sauce delicious. The land in the foot hills, where the sand cherries do the best, is stony and gravely. The professor says he has tested five thousand varieties of sand cherries by tasting. He used to

take water to the field with him to wash out his mouth; but now he can get along by taking water only at the end of each row.

Pres. H. M. Avery, of Sioux Falls, delivered an eloquent annual address.

The secretary's report showed that the society has thirty-four members.

The vice-president, from the Watertown district, made an interesting report.

Vice-President Dougan, of Plankington, reported a rain fall of twenty inches. He saves moisture by plowing deep with a sub-soil plow; but he cultivates shallow. He has three hundred apple trees growing, but none have yet fruited. A member from Vermillion remarked that they did not raise apple trees; they raise apple bushes. Prof. Hansen spoke highly of the Repka Malenka, of the Martha, the Mary and Lyman's Prolific. He thinks the Beta grape promising.

A. Norby, of Madison, reported that the Wealthy is doing better than the Duchess. He has an orchard twenty years old. Patten's Greening and Malinda killed back badly. The Martha will not bear. Lyman's Prolific is very hardy. He has grubbed out his Transcendents. A member remarked that the best thing to graft on a Transcendent was an ax.

E. D. Cowles, of Vermillion, remarked that when a man raises a grape in South Dakota it tastes sweet. Mr. Norby once had twenty-eight varieties, but he has none now. Prof. Hansen could not recommend any variety of cultivated grapes for South Dakota.

C. O. Bailey, of Sioux Falls, read an interesting paper on ornamental trees and shrubs. He had found the soft maple short lived. Wier's cut-leaved maple was unsatisfactory. Norway maple gives good results. He prefers the purple-leaved Reitenbach variety, but says it is liable to winter-kill some the first winter. Schwedler's maple is of compact form and very hardy. Acer polymorphum has not given good results. Sycamore maple winter-kills. Rock maple is hardy but of slow growth. He reports a natural grove of rock maple at Sisseton. Ailanthus winter-kills but can be cut down every year, and the sprouts give a tropical effect. Cut-leaved elder is doing well. The Juneberry is a satisfactory lawn tree; its leaves turn to an intense crimson in autumn. Weeping birch is very hardy. Hickory is hardy but of exceedingly slow growth. He has had no success with chestnuts. Catalpa speciosa is doing well. Hackberry is an exceeding symmetrical tree. Cladrastis tinctoria seems to be perfectly hardy; grows as fast as basswood. The

writer had tried fifteen times to raise a beech in South Dakota without success. He had found the ash a very satisfactory tree but hard to transplant. Green ash was infested by borers. He found the Kentucky coffee tree to be a very satisfactory lawn tree; it is so open as to not kill out the grass. The Lyriodendron will not grow. The Russian mulberry is a success; the weeping forms have not been tried long enough. He does not like the box elder; compares it to a Ben Davis apple. He has had very good success with the golden oak (Quercus concordia). Ginkgo tree is not satisfactory; grows slowly. The linden is very satisfactory; the red twig variety is doing well. He reports that every variety of elm is hardy. Ulmus Montana, the Belgian elm and the Siberian elm are very satisfactory. Purple and golden elms do very well. Carolina poplar is unsatisfactory. Japan quince is very satisfactory. Weigelia winter-kills. Hibiscus is not a success. Hydrangea does well when sheltered. The high bush cranberry is very hardy. Philadelphus is very hardy. Spiraea Van Houtii is the standard shrub. Scotch laburnum does well. Golden elder has lived two winters.

John H. Miller, of Huron, has made a success in raising American mountain ash. He has the wild olive thirty-five feet high. The catalpa is doing well with him. Lilacs and Juneberries are doing well. Choke cherries are a success, and buckthorn is an iron-clad. White cut-leaved birch is perfectly hardy. Trailing juniper is the most beautiful thing he has on his grounds. Prunus triloba is extremely hardy and a free bloomer.

I. J. Nudd, of Sioux Falls, gave a flattering account of the profits of vegetable gardening. When questioned, the fact came out that profits depended very largely on the man.

Thomas A. Hobart, of Sioux Falls, read a paper on "New Points in Vegetable Growing." He plants everything in hills, except beans. Does not use stable manure on garden crops; puts it on his corn. Uses nitrate of soda for fertilizer. Mulches cauliflower with stable manure. Plants Quarter Century and Fordhook Fancy tomatoes and Rocky Ford and Fordhook Early melons. Thinks highly of Hansen's No. 3 (muskmelon). Prof. Hansen says Jennie Lind is the earliest melon.

A. Norby, of Madison, had set Norway spruce once but lost them all in 1894-5. That winter also used up his arbor vitae. His black spruce were gone too; poor tree. White spruce were doing well; got them of Douglas. Blue spruce from Colorado are hardier than from eastern nurseries. Black Hills spruce, and Pinus ponderosa from the Black Hills, are good. Jack pine from Minnesota

is a rapid grower; lost some during the last two winters. Scotch pine cannot be relied on; shows dead limbs and leans over heavily to the north. Colorado silver fir is not so hardy as blue spruce. Douglas spruce from Colorado is doing well; not so well from eastern nurseries. Red cedar is one of our best trees; trees planted twelve years ago are now fifteen feet high. Silver cedar from the foot hills is hardier. Wyoming silver cedar look a little greener than the common red cedar. He covers his young red cedars and all his young evergreens in the winter with earth; puts it on late, after danger from rains is past.

George H. Whiting, of Yankton, corroborates Norby. He places arbor vitae, Norway spruce and balsam fir on the black list. Red cedar and Ponderosa pine are varieties to tie to. Scotch pine has had its day. Austrian pine is not much better; a little handsomer than the Scotch. Dwarf mountain pine is doing pretty well. Hemlock is of no account. Black Hills spruce is adapted to the climate; grows slowly. Juniper savin is doing well, but trailing juniper from the Black Hills is better.

Mr. Hunter, of Sioux Falls, had recommended Scotch pine. Had set seedling trees years ago, thinking they were the best. Had changed his mind; limbs are beginning to decay. Now gives his preference to red cedar. Austrian pine has longer leaves and is thicker.

A. C. Soderberg, of Sioux Falls, had begun to plant apple trees in 1879. Had only one noble Wealthy left from that planting. The Lucas winter crab had done well. The Duchess is subject to sun-scald. The Whitney was excellent; the Tetofsky a sky bearer, but the Wealthy was the noblest tree of them all.

Hon. H. W. Lathrop spoke of the Whitney as the best canning apple. He does not pare them; quarters them and leaves the skin on.

I. W. Prosser, of Hurley, who has purchased the Alderman orchard, read a paper. He says Plumb's Cider is bearing well in the Alderman orchard. It keeps rather better than the Wealthy. C. W. Gurney, of Yankton, says Plumb's Cider is as good as the Wealthy. He says, always plant yearling trees.

W. H. Hinds, of Parker, says air drainage is not necessary in Dakota. He thinks Dakota orchards are not planted thickly enough.

Prof. Hansen recommended crab stocks, and Mr. Cowles added that the Nebraska Ben Davis shown at the Pan-American was on Pyrus baccata. Mr. Norby could not see why a tree which fails on

a piece (crab) root would succeed on a whole crab root. In Europe, he says, layered trees are considered the best. Mr. Gurney was of the opinion that dry weather rather than severe cold was the cause of root-killing. Siberian crab was never killed during any test winter yet known.

George Cassady, of Valley Springs, began orcharding in 1878. The trees he planted then are all dead. He planted again in 1880. The Wealthy, Duchess and Whitney do the best. Mulched trees do not grow so fast as cultivated trees. Several members favored mulching for apple trees.

W. L. Held, of Lecher, has had fair success with plums. He planted pits of De Soto, and has raised his plums from pits. Has now one hundred ninety trees, all fruiting. His orchard cost him eighty-five cents. Mr. Norby advised planting plum pits and apple seeds. Mr. Gurney, although a nurseryman, said we would be further along if grafting had never been invented. Mr. Cowles is, too, an earnest advocate of getting all trees on their own roots. Plants sprouts; does not want grafted trees. A three and a half acre plum orchard at Vermillion, on its own roots, has brought $4,000 in nine years. H. L. Hanson, of Viborg, has a sixteen-acre apple orchard. He chopped out one hundred Transcendents for blighting. The Early Richmond cherry is doing well with him.

Corn stalks and fox-tail grass were recommended for winter protection. Tie them on the trees with binding twine.

Fred Noerenberg, of the Black Hills, reported that the Duchess, Maiden Blush, Willow Twig, Walbridge and Hyslop were doing well with him. Early Richmond cherries are immense. He cultivates clean. Sows turnips between the rows in August. Is growing Early Transparent and Gideon, Flemish Beauty pear and Bokhara peach. Mr. Whiting said he was surprised at the fruit he saw growing in the Hills. He said the Martha crab was loaded, and they even raised Baldwin apples.

Hon. H. W. Lathrop gave an interesting account of the progress of northwestern horticulture during the past fifteen years. He urged the planting of apple seeds.

Prof. Hansen gave an interesting account of the seedlings he is raising. He has fifteen hundred seedling hazel nuts, four thousand plum seedlings and five hundred seedling sand cherries. He has pears from Asia, and many ornamentals. Those interested should send for his latest bulletin.

ELM TREES AT MINNESOTA STATE EXPERIMENT STATION.

PROF. S. B. GREEN.

The illustration shows the appearance of elm trees at the entrance of the Experiment Station grounds. These trees have received an annual pruning for about seven years, and it has served to give them a very compact form. In pruning, the aim has been to preserve a strong central shoot and to shorten the side branches to prevent their interfering with its growth. Such trees are much less liable to break down in wind storms than those that are left to grow as they naturally will with spreading curved branches.

STREET ELM TREES TRIMMED FOR UNIFORMITY.

NATIVE SHRUBBERY IN ORNAMENTATION.

LYCURGUS R. MOYER, MONTEVIDEO.

Some years ago the word went forth that the Norway spruce trees in Central Park in New York were failing. It had taken a half century to prove that a foreign tree was not adapted to American conditions. It is now some years since this society ceased to recommend Norway spruce for general planting. The white spruce was found to be better adapted to our climate. Likewise it is now pretty generally admitted that a cottonwood—poor as it is—is a better tree than a Russian poplar. For planting on a western prairie a silver maple is a far safer tree than a Norway maple. We are likely to find that a Pinus ponderosa is a safer tree than a Scotch pine. A red cedar is more to be depended upon than an European larch. The choke cherry of Minnesota is a hardier shrub than the bird cherry of Europe. For a long period of time plants have been adapting themselves to their environment. Through a natural selection extending over a long period of time the fittest have survived. It stands to reason that in any neighborhood the shrubs best adapted to that neighborhood will be found growing in the woodlands nearest at hand. The native shrubs will be those best adapted to withstand the peculiar local climatic conditions. They will not be so apt to be found uncongenial to the soil of the neighborhood.

Our native forests and shrubberies are disappearing at so rapid a rate that it will be found worth while to preserve at least a few specimens as a curiosity.

On the prairies of western Minnesota and South Dakota there was one shrub that had kept up the fight between the little groves of timber and the encircling prairie from time immemorial. This was the wolfberry (Symphoricarpos occidentalis); and it will be found to be a very good border shrub even now. It will grow, too, without coaxing and will rejoice at good cultivation. The botanists credit Minnesota with three other species of Symphoricarpos, all of which may be safely planted.

The prairie flora is fast disappearing—has gone, we may say. The first settlers who went on the prairies would never have thought of preserving that omnipresent prairie shrub, the shoe-string (Amorpha canescens), but now when it is so nearly exterminated a few specimens may well be preserved in the shrub border. The more rare fragrant false indigo (Amorpha nana) is a desirable dwarf border shrub, although I have never seen it mentioned in a

nursery catalogue. The larger Amorpha fruticosa, from the river banks, may go into the shrubbery too, where it will be at home with good cultivation.

The wild plum (Prunus Americana), the western sand cherry (Prunus Besseyi), the wild red cherry (Prunus Pennsylvanica), the choke cherry (Prunus Virginiana), and the western wild cherry (Prunes demissa) are all extremely attractive shrubs for border planting. The wild red cherry, with its slender, pendulous branches, is particularly fine, and when given good cultivation it becomes one of the most graceful of large shrubs or small trees.

There are several species of thorn (Crataegus) native to the state, now the subject of special study at the state university, and all well adapted to border planting. They all show attractive flowers in early spring and show fruit toward autumn.

At least two native Juneberries (Amelanchier Botryapium and Amelanchier alnifolia) produce feathery leaves and beautiful flowers in early spring, and a valuable fruit in June.

The wild roses, of two or three species, may be given a place in the border with good results. The American mountain ash (Sorbus Americana) is a native of this state and deserves to be planted. The shrubby Potentilla (Potentilla fruticosa) is a desirable little shrub and succeeds well in any good garden soil. The nine-bark (Opulaster opulifolius) is a beautiful, thrifty, vigorous shrub usually classed with the spiraeas. The native spiraeas, S. salicifolia, S. tomentosa and S. Douglasii, may be planted with good results. Kinnikinnik (Cornus amonum), red-osier cornel (Cornus stolonifera) and Cornus alternifolia are common throughout the state and well adapted to cultivation in the home shrubbery. The silver berry (Elaeagnus argentea) is a native of northern Minnesota and has been introduced to cultivation with good results. Another silver-leaved shrub is the buffalo berry. It should be set with a dark background of other trees, preferably evergreens. The buffalo berry is a beautiful shrub, especially in autumn, when the pistillate plants are covered with red berries. The high bush cranberry and its garden form, the snowball, are native plants that are indispensible to the shrub border. A closely related shrub, the Viburnum lentago, should not be overlooked. Its shining glossy leaves, its broad cymes of white flowers and its black fruit make it an attractive object at any season of the year.

This paper already sounds too much like a catalogue, but I cannot refrain from mentioning the sumach, the red-berried elder, the black-berried elder, the flowering currant, our native Philadephuses,

our wild honeysuckles, our Virginia creeper, our climbing bittersweet and our burning bush.

I once made a drive in this city (Minneapolis) with a member of the park board by the way of Loring Park, Kenwood Boulevard, Lake Calhoun, Lake Harriet, and then south to Minnehaha Creek. We saw the best that the landscape architect was able to do; but it was not until we came out on the boulevard along Minnehaha Creek and saw nature's own inimitable planting, made up wholly of grass, flowers and our own native trees and shrubs, that we saw a restful, satisfying picture.

The President: It seems to me this is a subject that all members know something about: trees that belong to this high northern latitude that for centuries have withstood our long winters and our drouths. I think he left out one we used to cultivate in Massachusetts and New Hampshire in our gardens, the little waxberry, or snowberry. It grows on the prairies, bearing little white waxlike berries.

Mr. Geo. R. Hazzard: At the Interstate Park I have been looking after the native plants and trees and trying to arouse the appreciation of the people who live there, but I am sorry to say a great many do not know what they have there. I came over to this city a few years ago to attend the meeting of the American Park and Out-Door Art Association, and I was glad to see their appreciation of our native shrubs and trees. I hope every man and woman here will go home filled with the desire to do something for their school houses and their neighborhoods in the way of ornamental planting of trees and shrubs. Do not forget that our native shrubs and mosses can be made to grow.

Mr. Yahnke: I would like to ask whether any one has had any experience with the Mayday shrub. I got this shrub from Prof. Budd, of Ames, Iowa, about ten years ago, but I am very much disappointed in it. It looks too much like the flowering almond, but it does not bloom, and I would like to know whether anybody else has had any experience with it.

Mr. Wedge: I think I know something about that shrub. I cannot say that I have had a different experience from that of Mr. Yahnke, but I suppose in sending out such a multitude of things they expressed something else, as a nurseryman might be likely to do. I think there was sent out some seedling, something different from what was intended to be sent, as my neighbor, Mr. Kimball, of Austin, has a Mayday tree from Ames, and his is very pretty and nice, and he esteems it one of the finest things on his place. It seems to be a very hardy native and resembles what we received from Prof. Budd.

However, I want to say a little something about our emphasizing the native shrubs. I presume the danger is really the other way, and we are more likely to overlook the native shrubs. The statement is made too strong by horticulturists. I think we ought to be careful to be cosmopolitan in our tastes and accept whatever is

good. Judge Moyer made out a list of evergreens of European origin that are not very successful with us, but we have with us the white pine, which is a native and which is one of the forest trees we can plant upon our prairies. Another tree we can plant out in the open exposure, and a neighbor to the spruce, is the Austrian pine, which perhaps is a neglected tree, but which is one of the most valuable trees we can plant. I believe it is superior to the ponderosa pine, which is its very close relative. The spirea Van Houtii is a beautiful shrub, and it certainly is the superior of anything in the world. The Norway maple has had slurs cast upon it by this society. I think it has advantages in certain soils. On sandy soils, with gravel subsoils, I do not know of any of our native trees that are more truly at home than the Norway maple, and it endures such situations with peculiar health and contentment. I think it is the peer when in good health and vigor and power of any of our native maples. We have some in our city that are twenty-five years old, but especially in the latter part of the season, when other trees have lost all their foliage, this maple holds its foliage two weeks longer in its contest with other trees about it. The age of the trees and the cutting back we have often discussed. It is not so many years ago, when I was a younger man, I could tell you with confidence that a three-year-old tree was just the tree to plant and certain methods of planting were the only methods, but I find there is a large variation in these things, that a large tree will grow if carefully handled and will frequently outgrow and outfruit a younger tree planted with great care; and I believe, with good care, they will usually bear fruit earlier than a two-year-old tree. There is a great deal in proper handling. The summary of all I have to say is, let us be impartial in all of our views of these matters.

Mr. F. H. Nutter: There is another value that may be attached to our native trees and shrubs that has not been touched upon. These imported shrubs and trees we value so highly are not native forms where they originate. They are perhaps sports which have been kept in preservation. So another value of our shrubs is as a foundation to build up a system of improved native shrubs. We know by observation that many of these shrubs have some different specific beauty, different from some others of the same variety about it, and it seems to me by careful selection many native shrubs may be developed equal to foreign varieties.

ADDITIONS TO SOCIETY LIBRARY IN 1901.

A. W. LATHAM, SECRETARY.

Maryland State Horticultural Society's Annual report, 1899.
Wisconsin State Horticultural Society's Annual report, 1900.
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Presented by bequest of John S. Harris, La Crescent, Minn.

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POSSIBILITIES OF CLUB WORK IN THE RURAL DISTRICTS.

MRS. ANNA B. UNDERWOOD, LAKE CITY.

The last few years have chronicled a change in public sentiment regarding rural life in general, especially among the cultured classes. Time was when to live in the city or town the year through was necessary for protection and comfort; now, with the country opened up, towns and villages near, protection assured, postal communication so frequent that the news of the great world is quite as fresh for the country as for the town, with the possibilities of libraries near at hand, there is no longer any need of the derisive remark of "Country born and bred." The country has greater opportunities to produce true gentle-men and gentle-women than is possible to the city. City life is not conducive to wholesome, thoughtful and practical self improvement; it tends too largely to the dissipation of mental, physical and spiritual force. The constant desire for change and excitement can but produce its meed of stunted development along one or all lines of man's nature, for it is a law of nature that a perfect life is only attained by even development of the mind, body and spirit. So it is that thoughtful humanitarians are turning their attention to the solution of the present unfortunate condition of life in the world at large. Why the rich are rich is the result of forehandedness on their part, and the limited numbers are objects of envy. Why the poor are poor and so many very poor, is the result of ignorance. The very rich are no more happy than the very poor, for wealth is accompanied by heavy cares and responsibilities.

To reach a condition of content, people must be *satisfied* with their surroundings; and the apparently contrary statement is also true, that discontent is the first step towards advancement. If the country home is devoid of all attractions, lacking even in the common decencies of life, and *content* is present, it shows a low standard of mentality; but with discontent and restlessness as factors, a higher condition may be reached with requisite knowledge —knowledge that will bring about a different order of things; and it is this knowledge that will open the way to the possibilities that will lead to better conditions.

There are many channels through which this knowledge may be attained, but it will be necessarily a matter of gradual education, covering a longer or shorter period of time, according to the capacity to assimilate the material necessary for progress. The Agricultural School, the Horticultural Society, the Federation of

Women's Clubs and other similar institutions, have one primal object in view, the improvement of the race. Among the women of the cities and larger towns, much progress has been recorded resulting from organization of forces. They have come to realize that one person with a large expenditure of time and energy accomplishes little compared with the combined efforts of many. Women are awakening to the fact that they can be and are important factors in the world's economy.

Naturally the Women's Auxiliary is more largely interested in whatever relates to the improvement of the conditions of rural life, and sees that much may be done through combined effort. The members would like to urge the formation of neighborhood clubs, feeling sure that in time they would prove incentives to the accomplishment of better things.

The life of country women, as a rule, is one of barren routine, but needlessly so. Through a well defined effort and unanimity of purpose on the part of but two or three individuals, a wide field of self improvement may be opened up, accompanied by keen enjoyment and the satisfaction of knowing that the world at large is a part of individual life. Through the medium of a club many benefits may accrue to the home that will add to its comfort and improvement as well as serve to raise its mental and moral standard.

It is a generally conceded fact nowadays that it is not complete rest of the brain power that is necessary to prevent its breakdown, but a systematic and well defined change of thought that brings elasticity and strength. With the free action of the tireless powers of determination and concentration, together with the exercise of good common sense, the bodily and mental functions of the human being may be so controlled and directed that the so-called menial work will not drag down and debase the God-given power of thought and reason, but on the contrary raise it to a standard of well ordered mechanical work, the performance of which will prove beneficial in furnishing the requisite amount of exercise necessary for the maintenance of good health. A neighborhood club will be found a pleasing medium through which this healthful and inspiriting change may be brought about. The question now to be considered is, how can such a club be successfully inaugurated? Let the idea be formulated by the united energies of two or three harmonious women. After frequent consultation and careful deliberation map out a simple program for a year. Have the place of meetings at the homes and meet once a week. No dues are needed, officers are unnecessary, simply a tacit understanding that the hostess will take charge of the program for that day. Her duties, briefly enumerated

are as follows: to call the members to order, to keep track of the time, to see that each one has an opportunity to express an opinion and that only one at a time shall be given the privilege of the floor; also to see that the simple exercises shall begin and close promptly. The time assigned should not exceed two hours, and may be divided somewhat as follows: Promptly at 2:30 o'clock the members should be called to order, if only one is present. The advance work for the day should be taken up and considered for an hour. At 3:30 o'clock a discussion should be started upon what has been gone over during the previous hour. This will prove a useful experience, as it seems to fix the information gained and to improve the powers of expression. A half hour is sufficient for this portion of the program. The last half hour of the program should be given to general topics, during which time each one is to give an item of information gained either by reading or through observation, all the time religiously tabooing anything and everything relative to housework, home life or neighborhood news. Gradually and quietly add to the number of members, but limit the membership to ten or twelve. If more women are eligible, encourage and help them to establish another club. With too large a number, some will lose their individuality, then lose their interest in the work and soon drop out of the club entirely.

In mapping out the work for the year, do not assign so much to one member and so much to another to do, but require all to do the same work; then through some unforeseen illness or the absence from home of one or more members the others are not retarded or hampered in their efforts, and if only two are present the club work goes on the same. The absent ones must make up the lost lesson by reading at home. Another caution may be given right here: do not attempt to have refreshments in connection with the meeting of the club. Through the natural anxiety and worry of having this properly attended to by the hostess, it will detract from her enjoyment of and profit to be received from the program. It will necessarily involve the expenditure of time and energy that should be given to thinking and preparing for the study hours with the club.

A few suggestions will now be offered regarding the course of study to be pursued. First thought might suggest practical topics of household economics, but that would militate greatly against the object we have in view, which is rest in the form of change, variety, and recreation of thought. So let the thoughts stray farther away into the fields of literature, history, art, science, music, etc. Of course it is not possible to roam through all these fields at once, nor to thoroughly turn the ground over of either one, but think of the

pleasure of passing through the gateway and along some well trodden road in the field of literature! The familiar faces of Whittier, Taylor, Cooper, Willis, Scott and others attract the wayfarer, and the kindly, wholesome, interesting and instructive thoughts that may be gathered from their lips serve to give an impetus to free imagination, and thus lightened existence is raised above the ordinary routine of drudgery.

Even if time were limited, and they could not be closely interviewed, think of the enjoyment of simply peeping over the fence and gaining the mere knowledge of their *existence* and their influence upon the affairs of the world! Such a glimpse serves to break down the barriers of isolation, and a feeling of relationship springs up, which reveals in time the underlying principle of the soul's aspiration for a universal brotherhood of the race.

With so much to choose from, care must be exercised in not undertaking to cover too much surface during a given period of time. The time of a club should not be wasted upon the sensational, emotional writings of the day; in fact, it would be worse than wasted, for such reading is positively injurious to the whole human system. The object of the neighborhood club work is not to see how many books or topics may be read or discussed, for it is not the amount of ground gone over that marks improvement, but the amount retained that furnishes food for thought. For the first year or two one or more historical novels or books of travel would form the nucleus for the weekly programs. The first hour to be spent in reading alternately, then in the half hour, given to discussion, review what has been read. If it is a novel, talk about the different characters, their motives, their relations to and influence upon each other. If possible, look up the history of the time portrayed. If it is a book of travels, with the aid of a map locate the country and then follow the course of the traveler. During the week, when tempted to let the thoughts dwell upon the "miseries" of household affairs, direct them to run over what has been read. If a member is met, talk with her about the book or kindred topics.

A model club I know of was limited to ten members. It was started in February, 1889, and during the first seven years of its existence it followed a course in literature. Was this model club ready to stop when it had completed its course in literature? No. So interested were they and conscious of their ignorance of history that they had the temerity to importune the author of "The New Method of English Literature"—who had displayed such rare talent and intelligence in guiding and interesting them for so many years—to get up a course of history for them. This she consented to do,

and this model club will have spent six years next February in reaching the twelfth century of our era!

Think of thirteen years ofstudy and of companionship! During that time there have been changes, some sad ones, as four of the members are numbered among those that have passed away from this present earthly experience. The club still keeps up its interest, content with the weekly progress made, though ever conscious of the vast amount of knowledge that can never be compassed.

This model club was organized and conducted upon the brief plan outlined above. Some women may think they are too old to undertake club work, but this model club shows many gray hairs, some quite white, the youngest over forty and the oldest a *young* woman of seventy-five years. So age is no hindrance to club work. The one thing needed is inclination and a desire to improve, to be more companionable for the children, and not be looked upon as a "back number, respectfully laid upon the table for a while but eventually consigned to the shelf and forgotten although alive."

Do not be afraid that a few hours a week will detract from the accomplishment of household duties,—far from it. After the rest and recreation of thought, the mind and body are refreshed and brightened, and will be able to work more rapidly and to greater advantage.

None need be deterred by the lack of books. Many of the best standard works can now be obtained for a nominal price If possible, each member should strive to own a copy of the book read, for if a good one and worth reading it will stand reading many times at intervals. It can also be read aloud in the family circle. Perhaps not more than two or three books may be read during the year, but the practice of reading out loud, the words that will be added to the vocabulary, the habit of deferring to the opinions of others, the exercise of concentration and of memory, the many new bits of information acquired, will all wield great influence in character-building, and stronger, nobler and happier women will be the result, closely followed by brighter and happier homes.

Secretary's Corner.

A GOOD WORD.—"The Minnesota Horticulturist is worth more to me than all the other fruit papers I have ever seen, and I have taken several of them."

WE PRINT MORE MAGAZINES.—On account of the large membership it has been found necessary to increase the issue of the "Horticulturist" to 1300 copies, the regular issue being 1200.

A LATE JUNE NUMBER.—The June Horticulturist will be issued, probably, about June 10th. As it contains the notice of the summer meeting, it will be necessary to hold it till about that time in order to fix even approximately the date of the meeting that it come may at the height of the strawberry season.

DEVELOPING THE WILD FRUITS.—A letter from Prof. N. E. Hansen, of the S. D. Experiment Station, says he is planting over one hundred thousand fruit seedlings this spring, including sand cherries, choke cherries, plums, wild grapes, etc. This is a hopeful field for trial work, and persistence must develop results of value to northwestern pomology.

EXPERIENCE PLANTING CRAB SEED.—"Last year we received from the Department of Agriculture about one-quarter pound of Pyrus baccata seed in the middle of June. I finally decided to plant it. But only a small portion of it came up. I find now (April 15th), on looking over the bed, that the balance of the seed has started nicely and promises a good stand for this season."

SAML. B. GREEN.

REPORT OF THE SOUTH DAKOTA HORTICULTURAL SOCIETY.—The reader's attention is directed particularly to this report of a meeting of this kindred society, which should have appeared in the April number, but was crowded out inadvertently by the printer in the make-up of the magazine. The value of these reports is much enhanced by their prompt production, and it is the purpose to give them precedence over other matter.

SALE OF THE GIDEON HOMESTEAD.—The home grounds and orchards of the late Peter M. Gideon have been sold recently to two gentlemen, Mr. W. I. Gray and Mr. O. P. Briggs, both residents of Minneapolis, and we are informed interested in the development and care of the trial orchard. This will be good news for the many who were acquainted with the work Mr. Gideon was doing there and its hopeful character.

MEMBERSHIP FOR 1902.—The roll at date of going to press stands at 1153. Shall we make it 1200 this year? Except in the January issue no public record has been made of the assistance of our members in building up this large list, but it is the purpose to make a full statement of this work near the close of the year. Would you like to get into this honorable list? You have only to send one or more new members.

A SOCIETY MEDAL.—Negotiations are pending for the cutting of a set of dies from which medals may be cast to be offered as premiums by the society, as judgement may dictate. One side of the medal shows the seal of the society, as it appears on the front cover of the "Horticulturist," and the other side the words "For Services to Minnesota Horticulture," around the margin, with suitable scroll work, and the center left blank for inscriptions.

REMOVAL OF ANSEL GIDEON.—Ansel, the oldest son of the late Peter M. Gideon and the only one of his children remaining in this part of the country, following the sale of the homestead has decided to remove to Alberta, one of the northwestern Canadian provinces and engage in the nursery business there. Like his father he has evidently elected to be a pioneer in horticulture in an untried field. We hope to hear of good work he may do there for himself and the country.

SPRAYING TO THIN FRUIT.—"The Duchess apple is so very plentiful in a productive season that it is of very little value for market purposes. Last year was an off year, but we made more money from a small crop than could have been realized from a large crop in a plentiful season. We should diminish the production in seasons of plenty and increase it in the seasons of scarcity. To do this remove the fruit early in the season of the productive year and girdle July 1st to make trees bear the next year. The removal of the fruit might cause trees to bear the next season, but girdling will make it a comparatively sure thing. To remove the fruit by hand on the half of a good sized orchard would be a tedious job, and I propose to spray when trees are in blossom with salt and water just strong enough to kill the blossoms. I think one pound of salt to one quart of water will be about right. Spraying must be thoroughly done, otherwise blossoms will not be killed. The productiveness of other tree fruits may be regulated in the same way.

"A leaflet on girdling mailed on application. Send stamp."

E. H. S. DARTT, OWATONNA.

TESTING KEEPING APPLES.—"This winter I have been as usual, trying a number of interesting varieties of Minnesota apples to test their keeping qualities in my house cellar. The three best keepers that I have tried have been (1) Babbit, a red apple sent out by the Stark Nursery Co, of Louisiana Mo., of which I have now a few specimens in good condition. (2) Northwestern Greening I had until the 1st of April, and it seemed to improve in quality by keeping. (3) Of the Minnesota grown Ben Davis, I have just a few left. This variety is an excellent keeper and is of fairly good quality when grown in this state. The hardiness of the Northwestern Greening for planting in this state has yet to be determined. So far as I can learn in regard to it, on favorable soils it is extremely hardy and free from blight, but it is rather fickle about soils and in some locations does very poorly. The Ben Davis is too tender for general growing in this state, but in favorable locations in the southern half of the state it has produced quite satisfactorily." SAML. B. GREEN.

MORE ABOUT THE "PETER" APPLE.—"I was much interested in friend Dartt's article on page 36 of the January number of the Horticulturist. I wrote to Mr. Haviland, of Fort Dodge, Iowa, asking him what was the difference between the Peter and the Wealthy, and he said after handling them for years he could not see any difference. Also wrote to a Missouri nurseryman who advertised the Peter, and his reply was that he had not fruited the Peter long enough to be positive, but that apparently there was not any. We have the Peter as Mr. Haviland introduced it, top-worked on Hibernal. The

Hibernal has borne several years, but the Peter never has borne any. Have Peter from Chas. Leudloff, and it does not bear, while other trees received from him have borne for several years. Have also Peter from Mr. Yahnke, of Winona, top-worked on Duchess, and if these trees ever bear may find something different from Wealthy; but where to find it now I do not know."

S. D. RICHARDSON, Winnebago City.

THE MOTH TRAP—A WARNING.—"I have taken pains to get all the information possible on this subject so that there need be no further question as to its failure. Facts are what we want, and when our best scientists give us such an abundance of proof for their statements we should believe their conclusions.

"There seems to be no end to the proof here given that for the orchardist or fruit grower, the moth traps are not only worthless, but really a detriment.

"We ought to learn from the experience of others and profit by it, and not go to the expense of all these experiments ourselves.

"*We are sure that 'moth traps' will not catch Codling Moth, Curculios Gougers, Flat or Round-headed Borers, Peach Borers, Canker Worm Moth, and that they can never take the place of spraying.*

"It is a waste of money to buy these 'traps' and you should be convinced by the following list of names and experiments." (List omitted.)

L. A. GOODMAN,
Secy. Mo. State Hort. Society.

John L. Adams, of Glenwood, a life member of this society and its vice-president for the seventh congressional district, was killed by the accidental discharge of his gun while hunting on the lake near his home, on the evening of April 15th. A native of Minneapolis, he removed some years since to occupy a farm at Glenwood. His interest in fruit growing there led him to unite permanently with this society, and this interest was recognized by the society in electing him to the official position he was filling for the second term at the time of his decease. A rather short acquaintance impressed the writer with his personal worth and his value in the development of our special work in his chosen field. What seems to us his untimely removal is most sincerely lamented. His remains have been interred in Lakewood Cemetery, in Minneapolis.

O W Lord.
Among the Plum Blossoms
May 3d 1902.

THE MINNESOTA
HORTICULTURIST.

VOL. 30. JUNE, 1902. No. 6

Biography.

O. M. LORD,

MINNESOTA CITY, MINN.

(See frontispiece.)

The subject of this sketch is one of the early settlers of Minnesota, having in 1852 located a claim on the farm where he still lives, being at that time twenty-six years of age. Coming from the state of Michigan, at that early day already a fine fruit producing region, he brought with him a love for fruits as well as a taste for their cultivation, which has grown with his years, until for a long time his attention has been given almost entirely to this pursuit. Plums and berries, as he writes from his home in Minnesota City, "have always been a success with me, and in late years a few varieties of apples have done remarkably well." As a grower of plums, and especially as an experimenter with the native American plum, Mr. Lord is widely known, and his contributions to our knowledge of this fruit are among those of the highest value. His more limited success in apple culture is, in the judgment of the writer, largely ascribable to the comparatively unfavorable character of his peculiar location.

Mr. Lord is at this time in his seventy-seventh year, but full of vigor and ambition in the following of his favorite pursuit. The frontispiece accompanying this shows him as he appeared only a few days since in what were to him most pleasing surroundings. (The words found beneath it are of his writing.) The picture was

not taken for publication, and is all the more prized as evidence of his interest in this happy occupation.

Mr. Lord's earlier years were passed in the apple growing region of western New York, being born in Wyoming county, in 1826. In 1836 the family removed to Michigan, where he received his education, which was confined to the limited opportunities offered by the country district school. He must have made good use of these, however, as at the age of eighteen years we find him teaching a winter school in his neighborhood, a pursuit he followed the four succeeding winters, and until his marriage to Miss Martha E.

RESIDENCE OF O. M. LORD.

Deming, in 1848. In later years his experience and training as a teacher brought him incidentally into the office of county superintendent of schools, which position he filled in Winona county, in the state of his adoption, for eight years. He has also filled many other places of public trust, including a membership in the legislatures of the territory and state, respectively, in the years 1854 and 1874.

Mr. Lord is best known to our readers in connection with his work in this society. His name first appears upon its membership roll in the year 1884. His attendance at the meetings of the society and a personal acquaintance with the membership at once brought him into prominence as one of its practical workers, which was

recognized by his early appointment as superintendent of an experimental station located on his home grounds. His regular reports of this station alone, had he performed no other service for the society or the horticultural interests of the state, insures his standing with us. But besides this service he was for some time lecturer on horticulture with the Farmers' Institute, and is at this time a member of the Forest Reserve Board, horticultural editor of the Farm, Stock and Home—as a worthy successor of the lamented John S. Harris—and chairman of the seedling fruit committee, in which capacity he also succeeded Mr. Harris.

In recognition of his distinguished services to horticulture and the society, in December, 1899, at the annual meeting, he was made an honorary life member of the society, and in tendering this distinction the society equally honored itself. It is the connection of such men with this organization that gives it the high character and standing it maintains in our midst.

Of the seven children comprising the family of Mr. Lord, four are still living—three of them, with the mother, having passed beyond.

Notwithstanding his years, Mr. Lord is showing his faith in fruit-growing here by setting a new orchard this spring. "Not expecting," so he writes, "to reap largely from the fruit, but if I am permitted to share the fragrance of the blossoms I shall be well repaid." This brief quotation strikes the key-note of Mr. Lord's character and life, and in its fullness rings true with kindness, fidelity and loving service.

A. W. LATHAM, Secy.

Resetting Old Orchard Lands.—When the trees have been set but one or two years, new ones can be put in their place with little danger of loss, if the ground about them is mulched or frequently stirred. When only one tree in a place is missing it is seldom advisable to fill in an orchard after that time.

If the old trees have been fertilized and the humus has been kept up by means of winter crops, this can be done with little risk of loss, if the land is manured and a cover crop sown in the fall to be turned under in the spring before planting the trees. If, on the other hand, the land is in poor condition, so far as the humus and plant food are concerned, it will be best to use it for farm crops until it can be brought up into proper condition for planting. Thickly sown sweet corn will supply a large amount of humus for turning under.

IMPROVEMENT OF PLANTS.

PRES. W. W. PENDERGAST, HUTCHINSON.

THE SAND CHERRY.

The first thing to be done in the attempt to change over wild forms now worthless but holding out some promise that they will respond to proper cultivation and finally become valuable plants, is to establish a variation from the present stereotype pattern. These variations may be brought about in many ways, but principally by change in environment, by hybridization and by selection. To depend on natural selection alone would mean absolute failure. Great changes would in time occur from this cause, but they would not be of the kind we want. They would not correspond to our ideal. Artificial selection would be finally successful, but that "finally" is too far in the future.

A new, hardy and perfectly satisfactory cherry would be a great boon to the people of the northwest. In all kinds of fruit we can easily find or produce numberless varieties all of which are large, beautiful and delicious, many of them so nearly perfect as to answer every required condition except that of hardiness. A change from tender to hardy means an entire change in the character of the tree, to effect which is a tedious process, requiring many life-times. For illustration, a new variety of tomatoes or beans can be established to order in a few years in accordance with the ideal of the man who orders it, but to make either of these plants hardy enough to withstand a severe frost would require many hundreds of years, and the result would be a fruit very dissimilar to the original. Every other quality would have to be sacrificed to the Moloch of hardiness.

In the sand cherry we have a fruit which for generations unnumbered has, in its severe struggle for existence, been obliged to submit to the hardest conditions of scant soil, still scantier moisture and a most trying climate, in which tropical summers alternate with winters of arctic cold and almost arctic length. All these forbidding circumstances have done what man would have hardly had the courage to attempt, on account of the time required. That which is left for us to do after so good a start is much less difficult, and we should not be deterred from the undertaking by any obstacles with which we are likely to meet.

Changes of latitude, altitude, heat, light; soil with its scores of variations in sand, clay, marl, humus; its fertilizing elements, nitrates, phosphates, potash, etc.; its mechanical condition, density, porosity, compactness, friability, uniformity—all cause changes in

the character of the tree as well as in the size and quality of the fruit. More than this, the stubborn fixedness of type is modified, mollified and brought more under the control of the experimenter. The variations in environment, just alluded to, act upon the protoplasm of the plant and induce a response to accord with them, and these responses are manifest in the leaves, flowers and fruit, which will keep a true record of all the changes in environment. By simply adding to the quantity of salt in sea-water, surprising changes are quickly made in the growth, form and colorings of many of the lower orders of sea-animals. The same unchangeable law applies to plants as to animals. In the development of the sand cherry the horticulturist can control: (a) the surrounding air (by use of the greenhouse), (b) the character of the food, (c) the seed planted (always selecting that of the most nearly ideal plants), (d) the possible changes, by budding, grafting and hybridizing, (e) the water supply, (f) the amount and kind of cultivation. All kinds of violent changes and breaks in the natural way of propagation will cause an inclination to sport, and a sport is sometimes a near approach to the ideal.

The cattle-breeders tell us to name what we want and give them time, and we shall have it, no matter how difficult the task may seem. Semi-barbarians even have learned that "like produces like" and propagate from what they look upon as the best; but they have no logical plan of procedure, and what is considered the most desirable one year might be stigmatized as passè before the close of the next. With them "best" is but another term for designating the prevailing fashion, the standard varying like the inconstant moon or a lady's head gear.

To succeed one must first find out what he wants to do; he must know the object to be attained and then pursue it vigorously without variableness or even a "shadow of turning." He must understand the principles and laws that govern heredity, so that he may not be continually undoing with one hand what he has already accomplished with the other. He must know that the resemblance to ancestors is not merely a general one, confining itself to shape, size, color and flavor; but that it appears in the form and structure of every organ in bud, flower, branch and root, in behavior under unusual conditions, in vigor, in liability to certain diseases, in power to resist enemies, as well as in peculiarities of foliage, flowers and fruit. He must be a man with a purpose, must have a clear and well defined standard of excellence, and every step taken should count *one* towards its attainment.

By wise selection and proper hybridization defects should, one by one, be eliminated; so, on the other hand, excellencies, at first so

slight in degree as to be unnoticed and looked upon as altogether wanting, should be carefully sought out and taken into the account when propagating. The desirable qualities sought will, after a while, occasionally appear so distinctly as to be readily distinguished, but their presence will at first be uncertain and sporadic.

From this time on the advance will be more rapid. The original wild type, fixed by a thousand generations, grown under similar circumstances and with the same environments, will be broken. Instead of coming true from seed there will be a great variety in the seedling plants, and the opportunities for originating the desired variety will be very much increased.

In the case of the sand cherry a great start has been made by natural selection. Now much can be effected by crossing the most satisfactory kinds, using good judgment and pains-taking skill in making the most promising combinations and performing the necessary operations.

So much by way of introduction to the matter which I had in mind in writing this article, viz., the development of the native cherry into one of the most desirable of all fruits, the No. 1 cherry. To begin with, it already possesses some of the essential requisites to successful cultivation in this exacting climate, and these are of the first importance:

1. It is a fine, vigorous grower.

2. Neither the parching heat of summer nor the protracted frosts of winter injure it.

3. It is an early and abundant bearer.

4. Its enemies are very few, and it has proved its ability to fight its way against them all.

5. The flavor is better and the fruit larger than is the case with most other wild cherries.

6. The type already shows considerable variation, the fruit of some bushes, notably the Rocky Mountain, being much larger, more juicy and palatable than that of others in the same garden, showing that the process of melioration has already commenced, and that this variety will readily yield to the artist who lays his guiding hand upon it for the purpose of shaping its future to correspond with his ideal.

To undertake to change the common buffalo berry over into a large, luscious, marketable fruit would prove a more difficult task. Here one finds a type so fixed and rigid that many generations would pass before arriving at a point already reached by the variety under consideration, which now needs improvement along three lines only to make it one of our most popular, and deservedly popu-

lar, fruits. These are: 1, flavor; 2, size; 3, tree form. Every other thought should be banished from the mind of the experimenter who must keep his eye fixed like a flint on these three points, color markings, beauty, vigor of growth, earliness or lateness of season. *Everything* else should be disregarded so that attention may be directed solely to the matter in hand. In making a start much care will be necessary to select some of the largest and some of the best flavored cherries, planting the pits promiscuously at a distance from any other plants of the kind. When they come up, keep all pruned in tree form to prevent crowding and to note what ones behave the best under such treatment. The next spring at blooming time cross a number of the best flavored with the largest ones and with each other. Plant the cherries resulting from this cross, side by side in rows, the finest fruits in one row and those of the largest size in a parallel row, four feet distant. When these seedlings bear, select those that come nearest the ideal ones and grub out the rest. Keep on raising seedlings and hybridizing in this way, always crossing the best flavored with the largest of the second best, and soon include some of the plants that take most kindly to training to tree form. In crossing I would occasionally try to make use of plums or larger cherries, even though they be too tender to succeed unless so crossed. The trouble would be in finding a domesticated cherry which would take kindly to so violent a cross. Plums, however, can be made use of, this fact having been proved in the case of the Compass Cherry. If this fruit can be crossed back again with the sand cherry, the question of size will be pretty nearly solved, for, out of thousands of seedlings some would be as large as the Compass, and others as well tasting, though not so plum-like.

With repeated cherry crossings, using the choke cherry occasionally to give the tree form, the plum would eventually be well-nigh if not entirely eliminated. Meanwhile the pure cherry crosses must be continued and as fast as any gain is made along this line an outcross might be made, the hardiest of the large varieties—if any can be found that will take kindly to hybridization—always being selected. If nothing but the Compass and similar hybrids be found which can be utilized, then make more use of the choke cherry, and there will be no danger of reducing the iron-clad qualities of the original stock.

Remembering that there is no change in either the vegetable or animal kingdom so great that wisdom, skill, patience and perserverance cannot bring it about in process of time, let us enter the grand field that lies open before us with a fixed, determined purpose

to explore it fully with a view to getting whatever is of value out of it. This is not all going to be done in one generation,—but who is working for himself alone? He who undertakes to go through life with that idea uppermost in his mind is the one who by middle age discovers that "life is not worth living," and that his has been a failure. The largest share of happiness falls to him whose constant aim is to add something desirable to the common stock and place those who are to follow in a condition to lay hold of and enjoy the good things he has been fortunate enough to place within their reach. Before we were born, broad-minded, unselfish men spent their years in the delightful work of opening new avenues to enjoyment for the benefit of posterity. They paid no attention to the question which the Jewish money lender propounded to old John Gutenberg, who was borrowing at exorbitant interest to enable himself to perfect and make practicable his great invention. Gutenberg was fervidly expatiating on the immeasureable advantages which a knowledge of the art of printing would confer upon posterity, when he was interrupted by the friendly Jew, with "Tut, tut, John, do not impoverish yourself with any such nonsense. Let posterity take care of itself. *What did it ever do for you?*" All that the public benefactors of whom I am speaking asked for was that posterity might take half the comfort in the possession of these good things that they experienced in providing them. So they continued in their work, bearing in mind that

"Lives of great men all remind us
We can make our lives sublime,
And departing leave behind us
Foot-prints on the sands of time.

* * * *

"Let us then be up and doing,
With a heart for any fate,
Still achieving, still pursuing,
Learn to labor and to wait."

Prof. Hansen: We have at our place over 14,000 sand cherry trees. About 500 of that number bore fruit this year. The seed was planted in the spring of 1899, so this is the third season. We have the greatest faith in the sand cherry, and I will say that there are some of these fruits that I would be willing to send out next spring to people who know how to propagate. We do not want to propagate for the multitude, but only for the nurserymen and those who know how to propagate.

The President: Then you think there is a future for the sand cherry?

Prof. Hansen: Yes, for the western sand cherry, but not for the ordinary sand cherry.

Mr. Gibbs: I had an opportunity in South Dakota to learn a little about the sand cherry. I planted out two hundred bushes I obtained from my neighbors. I do not know whether they were eastern or western stock, but they were native in South Dakota. I discovered at once that they respond very quickly to improved conditions, and one way was by enriching the ground. There were a number of bushes that produced cherries that were about three-fourths of an inch in diameter. I promptly got the impression that they were not worth much for culinary purposes. The sand cherry gets a nice color and finish a little time before it is ripe, and perhaps people get prejudiced because they pick it too soon. Later on the neighbors' children found the sand cherries down in our garden, and I gave them leave to pick and eat all they wished. Some time afterward I got an order from a nurseryman in this state for a lot of seedlings, so I went down there to identify those bushes that bore the best fruit. I had already seen that there was as much difference in the quality of the sand cherry as there was in the native plums. I went through the bushes, and I found underneath certain bushes a lot of pits where the dried fruit was hanging on. There I got a pointer that was worth something. I got the opinion of the children as to which were the best ones to eat. They got the best ones and left the pits for me to pick up to grow stock from. In this improvement of the quality, given these better conditions of growth, I got the impression that it was no less due to the vigor and hardiness of the plant in resisting the winter's cold and the summer's heat than in the plant itself. That was worth something.

The President: I am very glad to find that those who have had experience with the sand cherry are of my way of thinking, and especially glad to know that Prof. Hansen has had so much experience in the matter, and the more experience he has the more confirmed it seems to me he is in his opinion that there is something good in the wild sand cherry. It is not owing to his vitiated taste. He is not like the man to whom Horace Greely wrote when the farmer asked him by letter if guano was good to put on potatoes. Mr. Greely wrote back that it might do for a man whose taste was vitiated by rum and tobacco, but for his part he would rather have good beefsteak gravy. (Laughter.)

Mr. Poore: We have a little shrub growing along our fences called the sand cherry. I am glad to know it is capable of improvement, and if there is any chance for improvement I want to know it. It suckers so badly that we consider it a nuisance.

The President: So does horseradish.

Mr. Poore: When I found it and tasted it, I found the pit too large and the outside not large enough, and there is no taste to it.

The President: I find, like Mr. Gibbs, the children cry for it like they do for castoria.

Prof. Hansen: If you have a sand cherry that sprouts suckers, you have not got the sand cherry; you have got the choke cherry.

GROWING SEEDLINGS TO IMPROVE THE APPLE AND PLUM.

WYMAN ELLIOT, MINNEAPOLIS.

This is somewhat of a complicated proposition, and it seems preposterous for one with so little experience in growing seedlings for the improvement of certain desirable qualities to attempt giving practical information to many of those present, who have had years of experience. When we think of the efforts put forth by such men as Peter M. Gideon, John S. Harris, O. M. Lord, H. M. Lyman and many scores of others in our own state and all over the world, who have devoted a large part of their lives to improving the apple and plum, what can be expected of an amateur whose knowledge of the scientific methods of the present day is very limited?

I have watched the progress made in trying to improve the hardiness of the apple by growing seedlings with considerable interest for the past thirty-five years, and the more I look at this question the more I become convinced it is a very uncertain problem, but I believe the persistent effort now being made by so many horticulturists will ultimately produce the ideal tree that will fulfill all the requirements needed. Should we realize how many seedlings of real merit H. M. Lyman has produced from the sowing of seed from one year's product of a certain Wealthy apple tree, we might think it a very easy thing to improve fruit trees by the ordinary haphazard seedling method. On the other hand, looking back upon the many years of persistent effort by Peter M. Gideon and thinking of the many years of constant sowing of seed and the many thousands of seedlings worthless as to hardiness, growth of tree, productiveness or quality of fruit, we should feel it was a great undertaking to secure all the requisite qualifications for fruit trees adapted to the complex conditions of this climate.

Trees and cions have been gathered from all parts of the world, and many seedlings have been grown, and the tree has yet to be found that fulfills the requirements necessary to win the $1,000 premium offered by this society for a hardy, productive, long keeping, high quality apple.

If our stock breeders wished to produce a first-class animal by using some particular crosses in breeding, they would study critically the many points of excellence of sire and dam and their ancestors as far back as possible. The pomologist attempting to improve the apple or plum in any particular direction should pursue a similar method, only in this case he has no long line of ancestral pedigree to refer to that will give him the requisite information;

consequently he must exercise great care in selecting those trees he wants for the parentage of his proposed new seedlings, if he expects to make any marked degree of improvement on the original stock.

A tree may have one or two essential qualifications but be lacking in others for a first-class sire or dam to breed from. I know of no fixed rule to guide the propagator in producing seedlings possessing particular degrees of hardiness, productiveness, size, shape, color or quality. So many elements are required to produce just the ideal tree, it is somewhat difficult to choose correctly; hence, it is at present a hit or miss operation.

Science, each year, is developing new discoveries and processes for the benefit of the progressive horticulturist, and he who expects to improve the apple or plum by the method of growing seedlings must keep in close touch with the progress of the age. Hand fertilization of the flowers and haphazard crosses, as performed by many propagators at the present time, give but little hope except in a limited way. I anticipate the greatest progress in improving the apple and plum for the climatic conditions of the northwest will come from giving closer attention to the study of interbreeding extra hardy varieties that have a natural affinity of blossom, cion and stock. The environment of the young plant and graft has also much to do with their successful growth and their cold and drought resisting qualities.

One generation of seedlings is not likely to give all the desirable properties of apple or plum, but by careful selection of the best through successive generations we may look for very great improvement in all the essentials that will make the trees of the future what we most desire. The time will come when the preparation of the soil by adding certain chemical elements will help to produce trees more hardy and of better quality, and I would suggest that experiments in this direction be conducted at our central experiment station.

There is a splendid opportunity for experimental work by enthusiastic horticulturists who seek renown and fortune by producing the ideal commercial apple and culinary plum.

Mr. J. S. Parks: I will give a little of my own experience in planting trees and raising seedlings. I am not in favor of this hand fertilization and doing it on a small scale, because I have always been in favor of wholesale fertilization, getting seeds by the quart and planting them with the expectation of getting something better. I have learned from what experience I have had that like produces like, and have not expected too much from planting apple seeds, as well as other seeds. I planted a lot of seed sent me by my friends in northern New York and Canada, and from those seeds I raised

a lot of winter keepers, but I found they were nearly all small, too small for practical purposes. This past summer I visited those localities and visited the trees from which those seeds were gathered, that is, gathered for the family use of apples, and I found those trees to be nearly all alive and doing well that the apples were picked from forty years ago and fifty years ago, as I knew them, and I remember some of those apples keeping all winter. It was quite a common thing there as they buried their potatoes in a pit for spring use to put in a few bushels of apples, of those same apples, and they would keep through the winter in that way. Those were the apples this seed was gathered from, and from the seed I planted I think I have forty or fifty varieties that will keep until May and June in a warm farm cellar. Now then, if they have produced in that way as a standard thing we can value, let us select trees here, which I have been doing lately. I have some Tallman Sweet trees growing, the limbs of which interlock with those of the Wolf River, and I have taken the seeds of the Wolf River apple, thinking I would get from it the size and from the Tallman Sweet the long-keeping quality. I am selecting seed in that way and planting a large amount of it, which will eventually give size and keeping qualities. We have plenty of small apples, we have harvest and fall apples, and if we can get a large long-keeper it seems to me we have struck the ideal. I can give instances where I have planted seeds from apples and knew what I had raised, and I think by gathering and planting in that way we may eventually get what we are working for.

The President: I would not advise the rejection of all that did not meet the expectation the first time, but would plant seed from some of the more promising ones again. Fruits and all kinds of vegetables will breed back five, ten or fifteen generations. Nearly one hundred years after that short-eared sheep craze went out there would be occasionally a lamb with short ears that could be traced back to the time of an almost earless breed.

Mr. Philips: I have visited a great many seedlings, and the finest seedling orchard I have ever visited was the orchard of Mr. Freeborn, and I will give you his plan. He saved all the seed himself from hardy, long-keeping varieties, and he saved it from trees that were grown near other good trees, so they were fertilized. One year he would go to work and save a quart or two quarts of Hibernal seed; the next year he would save a like amount of Duchess seed. He saved from the Fameuse, and he saved from the Utter, saving them from where he thought they had the best surroundings. He would plant only one kind each year. They were the best average lot of seedlings I ever saw. I went through the Duchess seedlings, and five out of six seemed to be good enough to plant. After his death I went there with Prof. Goff, and we marked a number of them that we thought were valuable. They were all seedlings that were grown from the Duchess apples. We could pick out a row of seedlings that were grown from the Utter apples. They did not all resemble the parent.

Mr. Brand: What varieties produced the best?

Mr. Philips: I think the best apples were in the Duchess row.

Mr. Brand: I think no one will make a mistake by planting seeds from the Tallman Sweet. I have thirteen seedlings just coming into bearing, and they are all winter apples.

Mr. J. S. Parks: Referring to the last remark, I have one tree raised from the seed of the Tallman Sweet. I got seed from a neighbor who had the Tallman Sweet and the little yellow Siberian growing side by side. There were only two seeds in it, and I planted them and kept track of them. One lived a little and died a little for a number of years, and eventually died altogether; the other has grown rapidly and has been a bearing tree for a number of years, but the apple is of the size of the little yellow Siberian, is a sweet apple, and is almost worthless because it is so small and hard, but it is a long-keeper. The tree is not a very good tree; it blights badly, like the Tallman Sweet and the Siberian.

MELONS AS A FIELD CROP.

L. P. LORD, OWATONNA, MINN.

The subject assigned to me is one which more concerns growers nearer a large city, as it happens, but I have made somewhat of a specialty of muskmelon growing for a number of years. I do not consider watermelons a profitable crop in Minnesota as a general thing, because they can be shipped in at so little expense from the south, where the cost of production is so much less. I will therefore only touch upon muskmelons as a field crop. Of course, the profitableness of melon growing depends largely upon nearness to a good market, picking the fruit at the proper time and marketing it so it will reach the consumer in the best possible condition.

In the first place, the field which is to be used for melons should be ploughed deep and thoroughly harrowed. I think deep ploughing, with fine harrowing, is better than to merely turn the surface, as the whole ground should be as fine as possible to conserve the moisture in case a dry season follows. In the field culture of melons it is seldom practicable to irrigate or water in dry seasons (melons do not need watering in an average season), and therefore this natural method of holding the necessary water in reserve, to be used as needed, is far the best, aside from the fact that rain is better for any crop than well water.

In marking the field, a four foot, and even three foot, marker may be used for the rows, and the melons planted in the rows at intervals of two and a half feet. The hills should be no nearer either way, and for extensive field culture planting farther apart would permit of cultivating with a horse longer in the season. If one's field is not too large, or with plenty of help, it pays to lay the

vines into the row and cultivate between them as long as the vines will not be injured by such treatment. And here let me say that in the growing of every crop a careful attention to little details at the proper time makes the difference between the profits of different individuals, which difference many times is not so explained.

For field culture it is generally understood that the seeds are planted out in the ground as early as possible, but I find if one has the facilities for growing the melon plants earlier under glass and transplanting to the field at the proper time, one can get earlier fruit but perhaps not so much of it. If this is done the plants need shading for a week or more after planting out, or until they become established. If seeds are planted one should put some fertilizer in each hill, cover it with fine mellow earth, and upon this drop the seeds, which are covered with a half inch to an inch of earth.

Constant attention to stirring the soil around the plant and keeping down the weeds stimulates early and vigorous growth.

Some years the cut worms cause much damage, no matter how vigilant one may be, and the method of placing shingles or pasteboard around the plants and into the soil, several inches below the surface, while very good on a few plants is not practicable for extensive cultivation. The little striped bug, commonly known as the squash bug, is the greatest enemy to the melon plants. I have tried many preventives, such as a weak solution of Paris green, lime or dust sprinkled around the plants and on the leaves, covering each hill with mosquito netting (an expensive method), planting pumpkin seeds around the hill, to give plants for the bugs to feed upon instead of melons, but nothing yet has proved satisfactory. My experience has shown that if the plants are grown under glass and set out at the proper time the bugs rarely harm them.

Some growers recommend nipping off the ends of the vines when they are three or four feet long, to get larger fruit, but we have not found this practicable.

As to varieties, the Emerald Gem has proved most profitable with us, being quite early and of the finest flavor. Though a little small, we have built up for it a reputation which makes a demand for this variety in preference to all others.

To sum up the essential points of the field culture of melons we have:

First: Deep ploughing and thorough harrowing.

Second: Marking rows three or four feet apart and setting the plants at intervals of two and one-half feet in the row.

Third: Early and constant cultivation, especially around the plants.

Fourth: Careful attention to bugs.

Fifth: Picking at the proper time and marketing at once.

Mr. Taylor: How many seeds do you plant to the hill?

Mr. Lord: Three, sometimes four. To many it may seem close planting, but I have found it successful where proper cultivation is given. The common method is to grow under glass. If you have facilities for growing them very early you will be surprised how large the plants can be grown and still set out without being injured, and you will be surprised how fast they will grow. By shading them they will grow quite rapidly, and the bugs will rarely touch them. The larger they are the less liable they are to be injured by the bugs.

Mr. J. V. Bailey: I would like to ask whether growing plants in beds and then setting them out is profitable?

Mr. Lord: I would consider it so because we get early fruit. One year another grower, who is a competitor of mine, raised five acres of melons, and I had all mine disposed of before he got his on the market.

Mr. Bailey: I found that growing melons under glass in the field last year was about as satisfactory as raising them in the hotbed and then setting them out. I mean just setting glass over each hill.

Mr. Lord: I use a small frame; part of them are wooden, but some I used were of tin and some of pasteboard. Those were very inexpensive.

Mr. Bailey: Our first were grown in the hotbed and then set out. We had little wooden boxes four or five inches square and set them out in the ground after they had started, but we found it more profitable to start them in flats and transplant them into pots and let them get as full of roots as they would hold and then set them out properly. In that way we had better success.

Mr. Lord: I would like to say again in regard to the striped bug, my experience has been that we can get rid of them altogether. By planting Hubbard squash near the melon patch and then using air slaked lime you can drive the bugs on the squash vines, and by the time they are through with the squash the melons are too large to be injured much.

Mrs. H. K. Eves: What size pot do you use?

Mr. Lord: Thumb pots, but they can be shifted into two inch pots; they have more room.

Mr. Oliver Gibbs: Upon this matter of growing muskmelons for market perhaps I can say something. I never grew then on a large scale; about 1,200 per week was all I grew. I learned the business by main strength, and I think I learned some things that might with advantage be communicated to others, although I know very well I cannot teach practical horticulture by telling how we did it. To avoid danger of late frosts in the spring and early frosts in the fall is one of the essentials of melon growing. Saving my own seed and having plenty of it I would plant three crops in succession, putting in the first as soon as I could work the soil, then the next on the same ground in a week or two, and af-

ter settled warm weather had set in I would put in the third planting. Sometimes the first planting would come through and my melons would be early, and sometimes the second planting would be the crop, and sometimes it would be the third planting. Another point on the same subject we discussed this morning, and that is, to market our produce so as to get the most money. I divided my melons into three classes. The first class were melons I knew to be No. 1 in every respect. Those I took to market, and those only. In the second class were those that I did not consider quite good enough to go into the first class, and those I laid aside to give to my neighbors. The third class I gave to the hogs. None went to market that I was not sure would grade No. 1, none but the very best. Prof. Hansen seems to be rather pleased to hear what we used to do in Dakota. A friend of mine said to me once, "If you only had that melon patch near Minneapolis!" "Yes," I said, "then I would have to compete with growers at twenty-five cents per bushel, but here I can sell them at $10 per 100."

Mr. W. G. Beardsley: I live in a neighborhood of large melon growers, and they have abandoned the idea of pot grown melon put out in the field. They plant the seed early and put in a second crop and also a third crop, and in that way get early melons.

HOW TO MAKE THE MOST OUT OF BLACK RASPBERRIES COMMERCIALLY.

O. M. LORD, MINNESOTA CITY.

If I answer truthfully and honestly from my own experience, it can be in three words: "Let them alone." Our secretary intended no doubt to have the "how" described from the grower's standpoint, but the grower "is not in it" commercially, in this part of the country. To make the most out of these commercially, in my opinion, a man should open a commission house in one of the large cities, quote prices above the market, sell to a capper, divide the profits with him and report the fruit as received in bad order and unsalable. In the Schley trial Dewey said repeatedly, that he did not want opinions, he wanted facts. I have here only given an opinion; if you want facts, make a trial of the business.

Let us now consider the commercial part from another standpoint. All fruit growers know that a radical change in the business has taken place in the last few years. Transportation has revolutionized truck farming and fruit growing. Let me illustrate from Bulletin No. 21 of the Agricultural Department. The first all rail shipment of strawberries to N. Y. city occurred March 30, 1889. In 1867 Crystal Springs, Miss., shipped a little fruit; in 1874 the business increased to 60,000 pounds daily; in 1895 forty-five cars daily were shipped from that one station, and corresponding quantities

from other stations along the railroad. To illustrate the transportation of perishable fruits at this time: It is estimated that there are 60,000 refrigerator cars in the service of the different railroad companies, and when we consider that the time of trains from New Orleans to Chicago is only fifty-five hours, it will readily be seen how our markets are supplied with fresh fruits.

It is also shown that, on an average, a distance of 100 miles makes a week's difference in the time of ripening of fruits. Beginning in Florida in March, extending into Mississippi in April, and then Tennessee and Illinois. As the season advances, our markets are well supplied till fruit ripens here.

There are also changed conditions in the consumption of fruits. Twenty-five years ago black raspberries were largely grown in the state of New York for drying. The grocers were supplied with the dried fruit, which has frequently been sold here in the west at sixty cents per pound. The industry was considered quite profitable, but the markets today will not use dried fruits when they can be had fresh.

It has been demonstrated that we can grow all the small fruits in Minnesota in abundance, but commercially we must consider the cost. It is well known that in truck farming and small fruit growing the most expensive part of the business is the hand labor required, and it is an established fact that the price of this labor is highest here, gradually decreasing as you go south, thus enabling southern planters to produce at less cost than we can. And where the commodity is grown sufficiently to be marketed by the carload transportation again plays an important part. A grape grower of Chautauqua, N. Y., can ship grapes to the twin cities at a cost of five cents per basket, while a single crate or basket of fruit will cost me thirty-five cents.

A man who grows grapes in N. Y. told me he had disposed of his crop, estimated at forty tons, for three-quarters of one cent per pound, and considered that he did well. If we should have to sell grapes at that price, the commercial prospects would not be flattering, but these conditions illustrate the commercial side of fruit growing, and may be applied to black raspberries. To be profitable, commercially, they must be grown in large quantities where shipping facilities are the best, or near the large cities, where the gardener does his own marketing.

Let us consider the subject without that word "commercially." How to make the most out of black raspberries? Place them on your table at meal time, three times a day during their season,

picked fresh from your own bushes, can the surplus for winter use, and if a surplus is still on hand sell to your neighbors who do not grow them. One hundred boxes from a row ten rods long is a moderate yield—200 not unusual. Two such rows will supply a large family. An early variety, like the Palmer, and a later one, like the Gregg or Nemaha, will serve to prolong the season.

Perhaps our secretary had in mind when asking for this paper thee methods of growing, handling, etc. This part of the subject has been so thoroughly discussed that the older members of the society could get little that is new, and if any of the younger members desire to engage in the business they will find useful and valuable information in back numbers of our reports.

Mr. F. I. Harris: Referring to the paper on red raspberries, I did not understand distinctly enough to know whether he cultivated one or both ways. Many of our farms stand at an angle of forty-five degrees, and instead of planting to cultivate both ways we plant the rows eight feet apart and the plants three feet in the row, and in that way we have better success.

The President: What is the advantage in planting in that way and cultivating only one way?

Mr. Harris: It washes too badly if cultivated up and down the hill, consequently we make the rows parallel with the hill and plant the rows eight feet apart and three feet apart in the row.

The President: How does Mr. Empenger cultivate?

Mr. F. J. Empenger: I cultivate both ways.

The President: It depends very much upon the lay of the land.

Mr. O. M. Lord: I would like to hear from Mr. Bush. I want to know whether I stand alone or whether others have had a similar experience.

Mr. A. K. Bush: His experience with black raspberries is about the same as mine. I planted a large field for family use, and I always find some people in the neighborhood who are glad to pick on shares, and our family is always supplied with fruit, while it does not cost much to cultivate and care for them. In that way we can get a profit from our field of black raspberries.

Mr. Rolla Stubbs: We find they are the most profitable berries we can raise. We can use only a small number to market, but we have calls for quite a number, and we consider them the best raspberry raised for family use. It seems the red raspberry sells largely on its merit and color, but I think the black raspberry is ahead in flavor and will yield more per acre. Being located as near the city as we are, they are more profitable to a certain extent on the market than the red raspberries.

The President: I always select the black ones.

Mr. O. M. Lord: I tried to confine myself in my paper to the word "commercial." I would like to know how many here consider they have made any money growing black raspberries the last three years.

Mr. Geo. W. Strand. I find there is a good deal of profit in raising the earlier varieties of raspberries. The Palmer comes on several weeks before the red and for that reason will sell readily for a good price, but after the red comes on they become prejudiced against the black ones, although I have a number of customers who will buy them in preference to the red. The later varieties are not worth growing commercially.

Mr. C. E. Older: I made a visit to Mr. Warren, of Woodstock, and he told me he had tried red raspberries in his garden and had failed three times, but finally put them in a cottonwood grove, and this year he had a good crop.

Mr. S. D. Richardson: In early days I found I could raise raspberries in a grove, but when the trees in the grove grew larger I could not raise any. That has been my experience. As far as the red and black raspberries are concerned, there are a great many people who like the taste of the red and who will not buy black when they can get the red. Some people will purchase the blackcaps every time. It is more a matter of taste and color, so far as my experience goes.

Mr. Wm. Lyons: On the market I can bring in fifty cases of reds and one or two of blacks, and the reds go right out while the blacks remain on hand until some housekeeper comes along. The blacks do not seem to sell on the market. I raise only a limited quantity because I cannot sell them.

Mr. R. A. Wright: There is something that has not been spoken of, and that is in regard to taking care of them. I would rather take care of two acres of red than one acre of black raspberries. So taking into consideration the care they require and other disadvantages I should place them rather low in the scale from a commercial standpoint. I find the blackcaps are very much subject to diseases we have had to contend with the past few years.

Mr. L. R. Moyer: It seems to me the general concensus of opinion is that we raise raspberries to eat and not to sell. Out our way we find the yellow is the best to eat, and as long as we get plenty of the yellow we do not care for the red or black. They suit us first rate.

Onions grown continuously on the same land are liable to attacks of onion smut. The smut organism lives in the ground and is rarely transferred except as it is carried on bulbs. Rotation of crops and deep plowing have been suggested as a remedy for this trouble. The fungus attacks the onion when it is very young. It has been suggested to grow the plants in soil free from the germ, then when they are well started set them in the open field.

Planting Trees in Sod.—If this must be done as is occasionally the case in city lots, turn the sod upside down so that it will rot. Allow no grass to grow within three feet of the tree planted on the lawn. Keep the soil around the tree loose and stir it whenever the surface begins to get hard.

THE PONDEROSA PINE.

A. NORBY, MADISON, S. D.

This tree is known as bull pine, rock pine or Black Hills pine. It occupies the driest and most exposed sites throughout the Rocky Mountain region, the Black Hills and northwestern Nebraska, where it is growing in the sod of the semi-arid tablelands. But it might be of more interest to know how it behaves in this part of

THE PONDEROSA PINE.

South Dakota. The writer started the first ponderosa pines from the seed here in 1890. Some of that seed was obtained from the Department of Agriculture, and some was collected in Custer county, Montana. These trees are now ten to fifteen feet high, vigorous and thrifty.

The only time that any died was in the winter of 1894-95, which was very trying on evergreens; seventy-five per cent of the Norway, or red, pine died, and arbor vitae and Norway spruce went out by the wholesale. Of the ponderosa, about twenty-five per cent failed to come through, and most of them were more or less colored. One specimen kept its pleasant green color then the season through

and has ever since. It is of a compact, more dwarfish growth than the average. The last trying winter the ponderosa came through without any loss, and they generally show very little discolored foliage in the spring. Five years ago, nineteen four-year old plants were stuck out in the prairie and left without any care whatever, and of these eighteen are now alive, look thrifty and are making a fair growth.

About the only objection made to the ponderosa is that it is hard to transplant, but my experience with it has been very satisfactory in this respect, rarely losing over fifteen per cent, and often not more than five to ten per cent, and that without shade or watering. This, however, applies to trees grown here in our fine mellow soil from the seed, where trees of all kinds push out an abundance of fibrous roots.

All things considered this is the most promising pine for the plains, where the white pine is not reliable. The Scotch is short lived at best, and leans heavily to the north; the jack pine is hardy and grows rapidly while young, but looks scrubby and inferior beside the stately ponderosa, with their very long, deep green needles and straight bodies. Here it never has a limb broken by heavy winds, is really pretty and promises to live a hundred years.

LEGAL PROTECTION FOR THE OWNER OF NEW PRODUCTIONS IN HORTICULTURE.

J M. UNDERWOOD, LAKE CITY.

When one thinks of the vast amount of time that is spent by our legislators in passing new laws for the government of this great nation, at an expense of millions upon millions of dollars, it would seem that it must be impossible for them to have overlooked a single thing and that there was nothing that needed legal protection that had not been provided for. In the commercial world, protection is given to every one, even to the smallest detail, and in the inventive realm the strong arm of the patent laws guards the rights of the inventor of a new style of tooth-pick or clothes-pin as jealously as the most wonderful of mechanical devices. There is hardly a thing in mechanical improvements to which the public has not been required to pay heavy tribute for a long period of time; and it may be that the inventor stumbled by mere accident upon the improvement. The products of authors and composers, too, are carefully guarded by our copyright laws, so that "Copyright" or "Trademark" is printed upon every package or article or publication that can in any way bring to its author a remuneration.

But there is one class of people who are entirely without protection. The horticulturist may spend his life in arduous toil to improve the condition of his beloved calling, and by so doing add to the comfort and happiness of his fellow man, and never secure a penny for the blessings his skill has wrought. He may receive honorable mention and be called a good fellow for having discovered a valuable new fruit. Or, he may, by years and years of planting, cultivating, cross-fertilizing, budding or grafting, succeed in bringing forth some new creation in plant or tree, in flower or fruit that is a wonderful addition to the economic as well as financial conditions of the world, but under the law he is left helpless to protect himself or to reap the harvest that his time and energy have entitled him to, while those who have done nothing to deserve it may step in and gather the reward to which our enthusiastic horticultural friend has alone just claim, without so much as even saying by your leave or thinking to thank him for it.

The situation reminds me of the time when I was a boy and used to go out hunting woodchucks. We had two dogs, one a large fine hound, the other an active little terrier. Both were keen hunters, but when they found a hole with a woodchuck in it, the hound could only bark and try to dig him out, but the ground was hard and the digging a slow process. The little dog would beg and plead to be allowed to have a hand in the matter, for he was courageous and a good fighter, and he knew he could get the woodchuck if only he could have a chance, but the big dog was selfish and would not let his little comrade come near until at last from sheer exhaustion he had to lie down and regain his breath and strength. This was the little dog's opportunity. Into the hole he would dart, scratching and struggling and squeezing his little body along deep into the hole until the woodchuck was reached, and then such a battle as took place was only to be judged by the barking and squealing that was heard, until, in a grip of death, they would both come scrambling out; then the big hound would fight off the little hero, grab up the woodchuck and with head high in the air and a sullen growl would say, "you go away; this is my game," and nothing the little dog could say or do would gain for him credit for the part he had so courageously performed. I always thought that the old hound deserved to be chained up to a post and the little hero allowed to have his woodchuck and the privilege of shaking it all he wanted to. And that's what ought to be done for the horticulturist. A chain of law should be put upon the public, and it should be required to keep hands off until he had shaken the fruit of his efforts or discovery enough to fill his basket full of reward.

I know it is argued by some that a new variety of plant or tree is a direct gift from God, and, therefore, it should be free to everyone, but I think that a weak and untenable position to take and no more applicable to plant life than to anything that the mind or skill of man may discover in other directions. Jacob Moore in writing upon the subject says, "I have many new fruits not yet introduced, far superior to anything of my production that has been disseminated. Of course, the work is unprofitable, not because fruit growers will not pay a fair price for new productions but because nurserymen, as a class, can put them on the market without paying the originator. The patent and copyright laws are barriers to manufacturers and publishers, compelling them, as a rule, to pay inventors and authors. Why should there not be a similar protection for the originators of new fruits? As for myself, I have had forty years of experience in the production of new fruits with free trade for their introduction and consequent failure to secure compensation."

We are all familiar with the experience of the late Peter M. Gideon in the introduction of the Wealthy, a variety of apple that should have made the man who produced it wealthy, but who never received enough to make himself comfortable. H. Knudson, a man who through a series of cross-fertilization produced the Compass Cherry, never will receive anything for his work. J. C. Plumb, the originator of Plumb's Cider, Geo. P. Peffer who gave to us the Pewaukee, Mr. Loudon, the discoverer of the famous and best raspberry we have, and many others who could be named, have never received any reasonable compensation for their labor. It seems but fair that we should have a national law granting to the discoverer or introducer of a new plant, tree, fruit, vegetable or grain the exclusive right to its propagation and sale for a period of fifteen years or more and making it a misdemeanor and punishable by a heavy fine for each offense for any one to propagate or sell it under any name whatever except by the consent of the owner. A law of this kind would be wonderfully productive of good results by stimulating the planting of seeds and the practice of cross-fertilization to produce new and valuable varieties. A late keeping, hardy apple for the northwest would be found if it was understood that the originator could not only secure the $1,000 prize offered by this society but reap a large benefit from the sale of the trees. It would set a thousand to experimenting where there is one now, and the horticulturist would be on an equal footing with the patent medicine man, the inventor and the author.

The President: At every session of the legislature there are quite a number of members that busy themselves all during the

session in looking out for woodchucks. The question is whether a law like this that Mr. Underwood recommends would be a woodchuck for the man that originates a new seedling. That is the question for you to discuss.

Mr. A. B. Choate: I was very much interested in the paper because, first, it is right in line with my business and, secondly, two or three years ago I read a paper before this society upon this subject, taking more particularly the case of Mr. Knudson's cherry tree. It seems to me, if I may speak upon the question from a legal standpoint particularly, that Mr. Underwood is right in saying there should be legal protection just as much for the man who would spend care and time in producing a new variety of fruit as is given to the man who produces a new kind of clothes pin. Mr. Underwood said there was no legal protection whatever, but there is no adequate legal protection which we can give the discoverer or producer, a protection he ought to have, in my judgment. It seems to me it is much more to the interest of the public that a man should be encouraged to spend his money and time in producing a new kind of fruit, especially in this northwestern country, than it is to encourage him to produce almost any other thing; whereas it is just the other way, a man is encouraged by law to produce everything except a new kind of fruit. As I explained to you before, in my judgment a man may be protected legally by making a contract with every man he sells to to the effect that this man shall not sell to any one else, and if he does the producer or originator can sue him for damages. That would do in a measure, but it is not an adequate protection. He ought not only to be able to collect damages, but, as Mr. Underwood says, it ought to be a misdemeanor. He ought to be punished if he violates the law. I do not wish to take up more time, but I fully agree with the author of the paper.

Mr. O. F. Brand: I am very glad to know that the correct position has been taken in the reading of this article, for it is a matter that the public generally takes very little interest in, and the attention of the public needs to be called directly to it. Several years ago I undertook to call the attention of a member of congress to this matter, and he did make an effort to have a bill introduced covering this matter, but he failed, but I think if there were a united effort made by horticulturists of this country we could get a law that would protect a man who originates or introduces a new fruit.

Mr. L. R. Moyer: It seems to me that on general grounds there ought to be some protection to the originator of new fruits, still to get such protection there would have to be a national law, and to have such a law would require an amendment of the constitution. If you remember the constitution it provides that congress may grant to authors and inventors a patent for the protection of their rights, but we cannot say that a producer of a new fruit is either an author or inventor. It is rather a gift of God, and it cannot be covered by a national law until we have a constitutional amendment to cover it, and you all know how difficult it is to amend the constitution of the United States. We might pass a resolution

approving an amendment to the constitution, but it will take a long time to adopt it.

Mr. Philips (Wis.): I just want to speak a word about what Mr. Underwood said. He cited as an instance of the injustice he mentioned the case of Mr. Loudon. Mr. Loudon was a man who spent a lifetime in trying to produce something new in the way of fruit. He produced the Jessie strawberry and the Loudon raspberry. His widow is trying to pay off a mortgage. It does seem as though if a man spends his time and money in trying to produce something that is for the general benefit of mankind there should be something done to protect him so that he will not have to leave his family in want, and even then it is probable he would not get enough to pay him what it was worth.

IMPLEMENTS FOR SMALL FRUIT CULTURE.

R. A. WRIGHT, EUREKA.

What we really need is a plow, harrow, cultivator and hoe, and if you have those implements you can raise fruit thoroughly well. I have some neighbors who raise fruit with less implements than that; they do not have much more than the hoe, but they do well with that. I have a few more on my place added to the harrow, plow and cultivator. I have three cultivators, and I would not like to get along without every one of the three. I find them all essential during the year. In preparing my ground in the spring for planting I must have a planter. I would not want to get along without one. Then I want two markers. I used to set a string. but I have outgrown the string business. As I set my plants four by six feet, I have to have two markers; they are necessary on my place. So far as the cultivators are concerned, I have a regular five-shovel cultivator, then I have a twelve-shovel, the shovels an inch wide—and that is the tool I would not want to be without; I make great use of that cultivator. If it is a little wet we need a double shovel corn plow, and in cleaning out strawberry beds the second year I find it very necessary; I could not get along without it. I think those are about all the implements I have on my place.

Mr. C. E. Sargent: What do you use to set out your plants?

Mr. Wright: I presume I forgot to mention the spade and shovel.

Mr. A. K. Bush: I have an attachment that I put on my cultivator that I consider excellent. It consists of a pair of wings attached to either side, and these can be kept sharp and will cut off all the weeds just under the surface. I would not take anything for them.

Mr. Wright: I was just going to say in regard to using the cultivators. I should use them in different ways during the summer. The five-shovel cultivator always ridges the ground. I find

by taking the small tooth cultivator and putting on the rake attachment it levels the ground and works nicely with me. I use one one week and the other the next.

Mr. Geo. Widger: I would like to ask whether anybody uses the hand cultivator. I have used that for the last three seasons. I think it saves the work of at least three men. We have the knives set close to the strawberry plants. After they get matted together we can use it, and I think a great deal of labor can be saved by using one of those little hand cultivators.

Mr. Jewett: I want to say a word in regard to the weeder. We have found Hallock's Success Weeder to be almost indispensable. The land is a sandy clay soil. After a rain we find we can go over a very large area of ground in a day. Then in connection with our cultivator we have an attachment that leaves scarcely a weed; it cuts them right off in the roots. The five-tooth cultivator does not cut the weeds away, and we have an arrangement we put on each side for that purpose. It is a steel blade, twelve inches long, set on a slant line to work on the inside when running between the rows, or set so it will run on the outside under the ends of the strawberry plants. It cuts everything underneath. We find it a very useful tool. The five-tooth cultivator and the twelve-tooth cultivator we find indispensable, and the weeder also at first when the ground is soft and mellow. Instead of using the double shovel, we use the one horse plow between the rows, and later run between them with the cultivator and level it down.

Mr. Geo. W. Strand: In preparing the soil for planting there is a new implement I got on trial this year that I find an almost ideal tool for every ground. That is the Acme harrow. It works on the principle of small knives. If the ground happens to be a little hard, it crushes the lumps and levels it down. It takes the place of both the spring tooth harrow and the smoothing harrow and levels off the ground afterwards.

Mr. Sargent: In regard to an implement for setting plants, I use the dibble, and I have very good success in using it. The spade is a little more handy, but it is more awkward to use. In ordinary years the plants grow well, and I have found no trouble in getting plants to grow. I have a dibble with a long handle, and another man comes along and sets the plants. In regard to cultivating red raspberries I have found it a good plan to take a one horse plow and plow close to the row; that kills all the suckers; then in a short time plow towards them again and level down with a fine tooth cultivator.

Mr. Wright: It seems to me that is the wrong way of doing that work. I would never put a plow into my raspberry field. You plow away from the roots, and in a dry season they will dry out and be killed.

Mr. Sargent: How can you keep suckers down?

Mr. Wright: Cultivate once a week and you will have no suckers.

Mr. Bush: The implement I spoke of will do the business.

Mr. Wright: Out our way we try to save the suckers.

BUD VARIATIONS.

PROF. SAMUEL B. GREEN, ST. ANTHONY FALLS.

We all have a confidence as the result of our experience that the operations of nature are measureably uniform and consecutive. Thus we generally believe that our native plants come true from seed and that seedlings vary very little, and yet on a careful examination of any of our plants it is plain that there are many small differences which in the first general survey we have overlooked. We find, for instance, that every living thing has individuality, that there are no plants or parts of plants that are exactly alike. The breeder says that "like produces like," and yet he knows that it is not really true, for the simple reason that like never did produce exactly like, and the fact that there are no things that are alike shows that the greatest tendency in organisms is to be unlike.

In thinking of plant individuals we generally think of the "seed individual," but there is such a thing as the "bud individual." If every portion of a tree is different from every other portion, then each portion has individuality. Perhaps the most correct way of thinking of a tree is that it is a community of individuals, a society, so to speak, made up of many members. As a rule, these members are so nearly alike that we say "they are as like as two peas in a pod," nevertheless there were never two peas in a pod that were exactly the same. Now when these "bud variations" become very unlike their mates, then we have what is known as "bud sports," or "bud variations." These are quite common, and it is only our careless observation that prevents our seeing more of them. Let me illustrate a few of these.

Here is a plant which I take at random from these standing here, which has its green foliage striped with white. This is known as Aspedistra, and each leaf comes from a bud, but some leaves are nearly white, showing a strong bud variation. The original plant had green leaves and did not show any decided variation, but under cultivation this plant has shown a strong tendency to bud variation, and by cultivation of plants we simply mean the keeping down of their competitors and the giving to them of every opportunity to acquire the benefits of light and air and plant food.

A few years ago Mr. Malmquist, Senator Washburn's gardener, grew a coleus which had red leaves and a greenish yellow edge. This produced a branch which was almost entirely greenish yellow. He propagated this branch and found that it had the power of reproducing itself from cuttings, and it was but a short time before we had a new coleus with greenish yellow leaves, and it was sent out under the name of "Fair Oaks."

Abutilons very commonly produce variegated foliage. I have in front of the greenhouse at the experiment station a plant of the old Golden Spirea which produces a side branch every season with green foliage. If this branch was used in propagation, the plants from it would have green leaves.

Among fruits adapted to this section there are very few that have come from bud variation, but there are a number of fruits that have originated in this way. The currant has been known to produce variegated foliage, and even white fruit has been produced upon the red fruiting kinds.

The Pierce grape originated from the Isabella. Its fruit is twice as large, and the foliage likewise larger and more vigorous than that of its parent, and it is a popular variety in some parts of California.

The peach has been known to produce nectarines on its branches, and nectarines likewise to produce peaches. Nectarines, too, have been raised from peach pits, and peaches likewise from nectarine pits. There can be no question but what the reason why the fruit from some trees of Wealthy and other kinds of apples differs in keeping quality and colors from the ordinary is that there is a bud variation; yet many times it would be hard to distinguish this from the effect of the stock upon the cion.

The European nurseries offer a large number of plants that have come from bud variations. Among them is the Variegated Ash, the Cut-Leaved Beech and the Variegated Dogwood.

These few thoughts will be enough to show that bud variations do occur, and if we were on the lookout for them we would see many more than we do now.

Dr. M. M. Frisselle: I would like to ask whether the absence of seed in the navel orange is due to bud variation?

Prof. Green: I cannot tell about that, Doctor. I know they have produced different oranges by bud variation, but whether this is due to bud variation I do not know. I think such effects have been produced.

Dr. Frisselle: Is the seedeless grape due to bud variation?

Prof. Green: I don't know about that either.

Dr. Frisselle: The currant that is sold in the stores is a grape?

Prof. Green: Yes, that is a grape.

Dr. Frisselle: They have been able to secure seedless raisins.

Prof. Green: I don't know whether that is due to bud variation. Many have come to us from Europe, and it is difficult to get at the origin.

The President: We will suppose a certain kind of fruit is not propagated for a hundred years and will not be for another hundred

years to come, and that the plant has yellow foliage, it is a sport, but in the course of a hundred years they plant the seed. Will that foliage be any more likely to be yellow than if it had been planted before it had been lost for so many years?

Prof. Green: I do not think that experiments have been carried on in such a manner that we could do anything more than guess. It is reported by some good growers that bud variations do effect seed production, and that certain bud variations come true from seed, but I do not know of a single instance. Olive trees very often produce bud variations quite distinct from the tree itself, and when you propagate the bud variation they come nearly true. This is simply a case of the possibility of bud variation. It may vary. My observation is so limited I do not know anything about the limit of the thing.

Prof. Robertson: You would not discourage the changing of bud variations in new things?

Prof. Green: I certainly should not; I think it is a very important thing.

Mr. Lord: To the ordinary listener a part of what Prof. Green says would appear contradictory when he says that there are no things alike produced in nature. If I may be allowed to explain I should say that many things are so similar that the ordinary observer cannot tell the difference. The saying is, "as like as two peas." If you plant peas you will not get beans, and so it is with everything in the production of nature. What this is which he calls bud variation it is difficult to determine. We can, of course, form a theory in regard to it and give it for what it is worth. You have heard a great deal about hybridization, fertilization and pollenization, and what is probably true is that the pollen of plants is what really produces these variable characters. It would seem contradictory also from the statement of a man who is well known to most of you by reputation, Mr. Burbank, of California, who states that a most difficult thing in all his work in which he has crossed and hybridized and produced new fruits and plants, is to predict results, or to produce a certain form or quality. There are few people aware of the immense volume and potency of pollen in the production of many of our plants. To be sure, among us farmers we understand only the crossing of corn. I have known corn fields to cross their products at a distance of half a mile, but when you realize that the air is full of this pollen, and that the corn plant cannot be reproduced unless the pollen falls upon the silk, it gives us some idea of the wonderful process that nature has adopted. These bud variations produce new varieties by simply taking a bud and splitting it in two and putting those buds on plants, where they would produce different varieties of fruit; or a union of two different buds or buds of different character would produce the same results as if one variety were placed upon another. This is a very interesting part of this subject. When we consider the very minute size of the pollen that is used or that develops itself and its character, we do not particularly wonder at the great variations observable. Prof. MacMillan in his lecture before the society two years ago advanced

a new idea to me, although I had previously paid attention to this pollenizing. It is not generally known and understood except by botanists that pollen of many varieties of plants is the plant itself, and that in the production of the plant the pollen must fall into it or be transferred to it in order to perfect its production. We will suppose that the pollen falls into a particle not adapted to its production, it dies. We will suppose it is partially adapted; it makes a partial growth; then the growth would be abnormal; but when you consider the minuteness of this pollen and that a single grain of pollen is a plant of itself it increases the wonder of these productions.

Mr. Brand: I have had a little experience in watching these bud variations. In 1874 I planted a block of Duchess. I dug out some but left 112 trees that came into bearing, and in that number there was one that produced a different apple from the others. At first I did not pay much attention to it, but when it continued for three or four years I became satisfied it was different, although it had all the appearances of a Duchess, and no one would have mistaken it for anything else but the Duchess. There is no difference in the flavor of the apple except that it contained a little more vegetable iron than the ordinary Duchess, but the form of the apple is a little different. It is more uniform throughout the tree than the Duchess, and it has a crimson color instead of stripes, and it has more of a bloom on it than the Duchess. After it had fruited four or five years I concluded I would graft it and see whether the young trees would retain these characteristics, and the young trees produced the same kind of apples as that one original tree. Then I began to read up on the subject, and in Mr. Darwin's works I read about bud variation. Now, to be brief, I will simply give what Mr. Darwin says in a few words, and that is, that in all plants that have been under cultivation for a long time the elements which go to make a new production of the sexual organs of the blossom are in the cellular structure of the wood and develop in bud variation. Now in those instances that Prof. Green gave everything is different. The buds on the same tree are different, but, as a rule, there is not that amount of difference that attracts attention, and it is only in isolated instances that the development is so marked that our attention is attracted to it. Since then I have noticed another Duchess in a younger orchard where I had planted three hundred trees. There is one tree that bears a much larger apple and a different color from the others, although it is a Duchess tree. I take that to be a bud variation and shall graft from it. The first one I mentioned I have been propagating and selling under the name of the "Red Duchess."

Prof. Robertson: I believe there is something in the plant, in the individual, I believe there is something in the soil, I believe there is a quality connected with the plant that may lie dormant until the proper condition of climate or development comes. I can give you a good illustration of this in connection with what is called the No. 13 corn. We were raising some of this No. 13 corn that had appeared from the north, and there never had been a sign of squaw corn. When we came to harvest it there was only one

ear in the whole field that showed some squaw corn kernels mixed in, and that was the only ear in the field that ever showed a variation. Thinking back of my own experience there was nothing to indicate what brought it about. I went to Prof. Hays and asked him if there had been any other quality of corn raised near the north farm, near this No. 13 corn. He said there had been. This corn after growing a number of years, six or seven years, showed only one ear of squaw corn, and that after being carried 150 miles from the place it was grown. There was something there that brought about the development of that quality so that it showed up distinctly in this one ear, and that is the only ear that showed it.

The President: It looks as thought we could not get any permanent fixity of type.

BEAUTY AND UTILITY IN ORNAMENTATION ABOUT THE FARM HOME.

A. K. BUSH, DOVER.

There was a time in the early history of this great commonwealth when the pioneers struggled for an existence and a home regardless of its surroundings. Well do I remember the 10x12 cabin in which our family lived during the summer of 1856, on a treeless prairie, miles from neighbors, and a day's journey from town, in southeast Minnesota. In those days no thought was given to ornamentation in or about the farm home, because bread and clothing we must have.

During the forty odd years since those sturdy pioneers made homes in our great state, they have been prospered and have grown rich in lands, money and experience. The log cabin has given place to beautiful homes with all the modern conveniences; the straw stables are replaced with commodious barns, which are filled with feed and feeders in large assortment and of excellent quality. The farms are supplied with the best labor saving machinery; a very large proportion of our farmers drive good horses with fine harnesses and an assortment of stylish carriages—but the home grounds, in most instances, are in a deplorable condition, regardless of the thrifty, independent circumstances surrounding the landlords. I have traveled in nearly every county in the southern half of our state and must confess that our farmers are giving less attention to ornamenting the home grounds, with trees, shrubs, and plants, than to any other department of the farm work. However, by way of encouragement, I will say that I can see great improvement in this respect during the past two or three years.

Where trees are planted very little thought is given to utility or arrangement in locating them so they may add beauty and

comfort about the home grounds. In many instances, we find the space between the house and the public highway so filled with large evergreens or deciduous trees that they entirely hide the building and obstruct every point of view. Again we find hedges of willows or shelter belts of evergreens planted so close to the buildings and barnyards that they cause the snow to lodge in great quantities just where it will do the most damage and be a source of great annoyance to all concerned. Another will surround his farm with a single row of trees so closely set that they will be the means of forming huge snow drifts in the highways and on his fields, robbing the soil of moisture and fertility for rods on either side. I might refer to many other mistakes the tree planters of the northwest are making in the arrangement of their plantings on and about the home grounds, but we should educate rather than criticise.

In my opinion every farm home should be protected and made more homelike with generous planting of trees and ornamentals. At least five acres—ten would be better—should be dedicated to that purpose on every farm of one hundred and sixty acres. A "picket line" of willow cuttings should be planted on the west, south and north, which will make an excellent snow break—but they must be ten to twenty rods from the buildings. Inside of these, rows of quick growing seedling should be alternated with those of a slower growth and of a more permanent character, such as oak, hickory, walnut, etc. Under protection of these a large assortment of evergreens and fruits can be successfully grown on any of our prairie soils.

The home buildings, barnyards, stock yards, orchard, gardens, etc., will have ample protection if five or ten acres of trees are planted in a block about them, and, at the same time, forest conditions will be established and maintained in the plantings soon after the work is commenced.

The lawn should contain no large deciduous trees or evergreens. Let them hide unsightly objects in the back yard, where they will furnish ample shade for the children with their swings, hammocks and other sources of rest and amusement, that should not be located on the lawn. In these shady places the men and boys can spend an hour, as they should each day after dinner, during the long hot days in summer. The lawn should be roomy and systematically arranged. Windbreaks and shelter belts should be located beyond the drives or public highways, with openings that may not obstruct the view of points of special interest, such as a lake, attractive landscape or beautiful woodlands in the distance.

With no large trees to rob the lawn of its moisture and plant food, the ornamental shrubs, flowers, etc., will thrive and appear in all their gorgeous glory. Dwarf hedges about the drives and walks, made of juniper savin, arbor vitae or similar things would add to beauty and utility if kept sheared and in order. A row of sweet peas supported with a wire trellis would make a pretty boundary line between the family garden and the lawn. A row of everblooming roses would answer the same purpose and require less time to keep them in a thrifty and decorative condition. A fringe of asters, dahlias, etc., between the house and walls makes a desirable addition to the general appearance of the home grounds.

The flowering shrubs should be planted in bunches in depressions rather than scattered about singly on mounds or even slight elevations, which shed water so effectively in the blue grass sod of our lawns. The bulbs and annuals which should be found blooming in great profusion about every farm home, should be grown in beds, each in a home of its own. Rustic arbors add wonderfully to the homelike appearance of the farm lawn. These can be constructed in a few hours by almost any enterprising, ingenious boy with a load of poles from the groves. An assortment of climbers, such as roses, ivies, etc., will add to their beauty and utility and should be trained there as well as over the porch and, perhaps, some of the windows in the house.

The rural school house, the church and the cemetery are so closely associated with the farm home that I cannot refrain from entering a strong protest against the manner in which they are kept in most instances. The usual and about the only decorations found on or about school grounds is a barb wire fence in the rear and two or three hitching posts in front of the building. The church grounds have the addition of a row of rickety old horse sheds. The cemeteries have the barb wire fence, to mark boundary lines, and the row of tie posts, but are usually a mass of weeds and brambles—all of which are a disgrace to our American civilization. These places, made sacred by their associations, should have the same care and treatment that I have prescribed for the farm home grounds. The school houses especially should be protected with a grove of seedling trees, plants, ornamentals, etc., that should cover five acres of land. These would serve as standing object lessons in practical forestry to the pupils of our state.

Every well kept home and public ground that is tastily planted to trees and flowers is accepted as evidence of refinement and intelligence. Our state horticultural and forestry associations, with their large membership, should feel, individually and collectively,

that they are the schoolmasters who are expected to enthuse and educate the people of our state along these lines. Judging the future by what has been accomplished, we confidently expect great results. Under the fostering care of these societies our state may earn the title of "The land of the best red apples," and should contain the best homes, the best decorated grounds and the best citizenship of any state in this glorious union.

Mr. President: It has always seemed to me a mark of very poor judgment for a man to spend twice as much as it would take to put his grounds in order in buying a fancy horse and buggy to ride once a week perhaps a few miles around the town, the horse growing older and decreasing in value and the buggy growing more shabby every year—and in ten years the money has to be spent all over again; whereas if he had spent just one-half in the ornamentation of his grounds, planting trees, shrubs, etc., in ten years the trees would be in their glory and would be a greater comfort and and a greater delight to him and to his children for the next hundred years than almost anything else could be. Some people ask me sometimes whether I expect to live a thousand years. I think the best way to prepare for death is to prepare for life. The best way to prepare for life is to be doing those things that need to be done, and whenever death comes let him find us all with the harness on.

Mr. Oliver Gibbs: I have nothing new to offer, but I wish to call attention to one point that has been so often mentioned in our meetings. There are many farmers and others who feel unable to buy the trees and plants from nurserymen that they would like to plant, but their grounds are situated near our timber lands and coulees, and if they would only fix their minds upon watching those wild things that almost immediately thrive under garden culture they could go out into the woods and furnish themselves with plenty of beautiful things to set out on their home grounds, and there is no expense connected with it except the labor. I remember that many times Judge Moyer has called our attention to that very thing, pointing out the value of those wild shrubs under cultivation. There are so many of them, and I need not name them now, that, planted in our gardens, instead of being little spindling things will fringe out into beautiful forms, with beautiful foliage and some with beautiful flowers.

Dr. F. M. Powell (Iowa): I think that was an excellent paper read by Mr. Bush. Perhaps the key note of the situation is that we neglect the children too much. The fact is, as has already been referred to in the address by Mr. Loring and others, it is environment that makes up our character, and if we can get the children enlisted in the conditions referred to in the paper we will make a success of it. Let them participate, and let them take a part in the work. I noticed in a garden a little fellow five years old planted a little bed of lettuce, and one head was a little off to one side, and he would have nothing to do with it, simply because it was off to

one side. The children want to feel that the work is theirs. "I am caring for this tree," "I am caring for this bed of flowers," and if they grow up with that idea in mind they will continue that way throughout life. Another important feature that we need to recognize is that the parents and children should move along through life together. The ordinary method of school life takes the children away from the parents. The children grow up and learn to feel that the parents are left out; consequently, they grow up to a considerable degree separated. Now if the home training in connection with the school training is such that parents and children can move along together through life, the parents will become interested in the surroundings of their children, and the children will reflect the sentiments of their parents, and it seems to me it will accomplish the great end of American life. Some method must be adopted by which they can move along together in life, and greater things are certain to come about.

Mr. A. J. Philips (Wis.): I don't want to discuss the paper, but I want to discuss what you said, Mr. President, as you looked around at me as though you thought I was the fellow that bought the horse. (Laughter.) My wife says it is the other way; I bought the trees, and she had to go afoot. A few years ago I went up to Sturgeon Bay to see a man, Mr. Zettel, and his great seedling orchard. He said to me, "You are the man from West Salem, and I am glad you came. I am pretty near through with this world, but I want to show you some things we have here." We went out to the orchard and looked at the trees. While I was examining a tree, I saw the old man digging in the ground. I looked to see what he was doing, and I saw that he had picked up an apple, had taken out the seeds and was planting them. I said to him, "What are you planting seeds for? You just told me you did not expect to live over winter?" "Well," he said, "I have got boys, and there are other people who will come after me that will like apples."

Mr. Poore: I am a new member of this society, for I have just joined it and become a life member. I read in the papers of this wonderful state, we see its wonderful exhibits at our fairs, we see its beautiful farms, and yet we see many farm homes where there is no dividing line between the barnyard and the door yard. Many of the farm children have no beautiful lawns and flowers to make an impression upon them. They do not see such things at home. I have studied to see why it is the parents do not take pains to beautify the farm home. I do not wish to hold myself before you as one who boasts of his own surroundings, but my first aim was to build me up a home, an ideal farm home. I had no idea of selling out in a few years and building a home elsewhere. I did not wish to leave my home. We were just told that parents and children should move along together. The children are ambitious to plant a seed and see it open and develop into something, as their father has done. The thought of home is in their minds constantly. One of my children went to Florida, and he wrote back how glad he would be when he got back home again. That did me good.

At the home where I was raised we had a pretty farm and a good orchard. I find with too many farmers it is simply dollars and cents; anything that cannot be immediately turned into a practical value does not pay. They say it will not pay, there is no money in it. A carload of trees came to our town. I made the remark that I would give five dollars a bushel for every bushel of apples they would raise on those trees if they would give me ten cents for every tree that would never have an apple. We must do something to change the method of furnishing trees to farmers. I know hundreds of farmers who bought apple trees and never grew an apple. They are either not educated to care for a tree, or there is a hitch somewhere. I have fifty dollars' worth of trees that never had an apple. I have seen the finest display of apples, so we know they can be grown. I believe this society should change its methods and educate farmers to cultivate apples. The children say, "Father never got an apple." Many of the older men say they will never plant another tree. I believe this society has a great duty to perform in finding out where the trouble lies and educating farmers how they may obtain fruit. We intend to have a county horticultural society and a county beekeepers' association so that we can get together closer and exchange ideas and then send a delegate to the state society.

PUBLIC PARKS.—The best evidence we have of intelligence, enterprise and good taste in a community is to find in it a well located, well arranged and well cared for public park. In locating a park it is best to secure if possible a nearby place, with plenty of shade without waiting for trees to grow and plenty of water. A park without water must always be a very tame affair. A site extending along the banks of a river or lake is desirable. If banks are low, perhaps excavation can be made and lagoons formed which will add greatly to the beauty of an already beautiful landscape. If no river or lake is available, then a creek, though small, may be utilized. Excavations may be made and dams may be erected forming little islands and lakelets that will serve as mirrors to reflect nature's beauties in ways most charming to behold. Should water become scarce, a gasoline engine will supply all demands, run gushing fountains and one arc light for each one horse power of the engine. A city without a park is not attractive. It is like a home without lawn, garden or flowers; like a picture book with the pictures all left out. It may do for stupid all-work and no-play people whose god is their money. But people of a more cheerful and social turn of mind, who realize that all the good things of this world were made to enjoy, can find more congenial homes in towns where nature and art combine to beautify and to charm. E. H. S. DARTT.

NOTICE OF

Summer Meeting,

1902,

OF THE

MINNESOTA STATE HORTICULTURAL SOCIETY.

The regular summer gathering of the society will be held as usual this year at the State Experiment Station, at St. Anthony Park, on Thursday, the 19th day of June. This date is set as nearly as possible to accommodate the strawberry growers in the part of the state most accessible to the place of meeting, and with this object in view the usual liberal premium list has been prepared.

The order of exercises for the day will not differ materially from that of similar occasions in previous years. The forenoon will give ample opportunity to those so inclined to look over the experiment gardens and orchards and observe the changes and progress in this interesting and valuable work. Several of the professors and their assistants will be in attendance to explain the character of this work.

At 12:30 o'clock basket lunch will be spread in Armory Hall, and all attending are invited to contribute towards this festive occasion. Every one is welcome. If not a member, $1.00 will make you such, if you wish, and give you the publications of the society and a voice in its deliberations.

At 2 o'clock p. m. the regular summer session of the society will be held. A short program has been prepared, having to do exclusively with strawberries and roses. Practical papers will be presented on these subjects as follows: On strawberries by B. T. Hoyt, Hamlin; Wm. Lyons, Minneapolis; O. C. Gregg, Lynd; Prof. S. B. Green and Prof. F. L. Washburn, the newly appointed professor of entomology at the station. On roses by J. M. Underwood, Lake City, and others.

Remember that the social feature is especially emphasized, and don't forget to bring along your wife or husband, as the case may be.

Meeting of the Women's Auxiliary.—The regular summer meeting of this auxiliary society will be held at some convenient time during the day to be announced.

HOW TO REACH THE GROUNDS.

Take the Como-Interurban electric car in either St. Paul or Minneapolis and get off at Dooley avenue, where carriages will be found in waiting to carry visitors to the grounds, one-half mile distant, from 9:30 a. m. to 1:30 p. m. Those who drive over in their own conveyances will find ample accommodations on the grounds for stabling.

Visitors should *NOT* take the Interurban car, but *TAKE* the Como-Interurban-Harriet car.

For further information address

W. W. PENDERGAST, President, Hutchinson.

A. W. LATHAM, Secretary, 207 Kasota Block, Minneapolis.

PREMIUM LIST.

All exhibits must be entered with the secretary and in place by 11:30 a. m., to be entitled to compete for premiums.

Exhibitors competing must be members of this society and the growers of the articles exhibited. The fruit and flowers exhibited must have been grown in Minnesota and be correctly labeled.

No premiums will be awarded on unworthy articles.

Fruit and flowers shown become the property of the association and will be used in connection with the midday lunch.

FLOWERS.

	1st prem.	2d prem.	3d prem.
Each named variety of out-door roses, six blooms	$ .75	$ .50	$ .25
Each named variety of peonies, five blooms	.75	.50	.25
Bouquet of garden flowers	1.50	1.00	.50

FRUIT.

(One quart of each variety.)

	1st prem.	2d prem.	3d prem.
Each named variety of strawberries	$ .75	$ .50	$ .25
Seedling strawberry never having received a premium from this society	3.00	2.00	1.00

VEGETABLES.

	1st prem.	2d prem.	3d prem.
Head lettuce, 4 heads	$1.00	$ .50	$ .25
Asparagus, 1 bundle	1.00	.50	.25
Peas in the pod, ½ peck	1.00	.50	.25
Rhubarb, 6 stalks	1.00	.50	.25
Early potatoes, ½ peck	1.00	.50	.25

Secretary's Corner.

EXHIBIT SOMETHING AT THE SUMMER MEETING.—Look over the premium offers and bring whatever you have that fits into it. We want a very full exhibit of the articles listed.

BRING YOUR ROSES TO THE SUMMER MEETING.—It is the purpose to give some time to the consideration of roses at the coming summer meeting, and a large exhibit of named varieties is desired. To encourage a full display liberal premiums are offered on each named variety. See notice of summer meeting in this number. Bring what you have, if only one variety.

"LESSONS IN COMMERCIAL FRUIT GROWING."—Under the above title Prof. E. S. Goff, horticulturist at the Wisconsin Agricultural College and state experiment station, has just issued a work gotten up to meet the special needs of his class-room. Its scope exceeds the range of possible commercial fruit culture in that state, being intended evidently to be used in teaching the principles and practices of the art in a general and comprehensive way, the semi-tropical fruits receiving equally a share of attention. It is intended, as he says, "as a supplement to 'Principles of Plant Culture,'" and the two works together make a excellent compendium of the subject. The student in practical horticulture in our state will find both these books of value to have at hand for reference and study, and especially so as they have been written by one who has had much opportunity to make practical study in a local way of most of the subjects treated. The volume is a 12 mo., 221 pages, and can be purchased of the University Co-operative Association, Madison, Wis., for $1.00.

THE 1902 MINNESOTA STATE FAIR PREMIUM LIST.—This list is now in press, and a copy will be sent very soon to each member of this society for 1901. Any who fail to receive it, or any others, can secure it by addressing the secretary, E. W. Randall, Hamline, Minn. The only change of special moment affecting the horticultural department is in offering the premiums on collections of fruit in lump sums, to be divided among all the competitors in proportion to the comparative merit of the various exhibits. The attention of prospective exhibitors is called especially to the general regulations, preceding the list of premiums in this department, and any special restrictions noted with the premium offers. With the gradual development of the department it becomes more and more necessary to enforce with strictness all these rules. Exhibitors are urged to acquaint themselves thoroughly with them by repeated reading and study. It will be of great aid to them in getting exhibits in proper shape and pay well in returns.

NOTES FROM THE OWATONNA TREE STATION.—On the tree station I raised a great many new varieties of apples last season as a result of girdling, many of which are winter varieties of great promise. My seedling M is a good keeper, of good color, size and quality. One apple tastes just like a banana. I would call things by their right names, so I call this Banana. Won't it be nice when we raise fine ripe bananas in Minnesota? I girdled alternate rows the first of last July. This will show results this season and enable us to note the difference between girdled trees and those that are not girdled. There are more than 600 grafted varieties of seedling apples which have originated here and are now mostly in bearing. E. H. S. DARTT.

GRAFTING THE PYRUS BACCATA (CRAB) SEEDLING.—For several years we have raised Pyrus baccata seedlings. Our purpose with these is to test their value as a stock for the apple in this section. It is well known that a great deal of the failure of Minnesota apples is due to the root killing, from which the Pyrus baccata is practically exempt. On the other hand it is well known that when top-worked the Pyrus baccata does not make a satisfactory stock for some of our larger apples, and our experiments are for the purpose of determining the value of this very hardy stock when root-grafted or budded near the surface of the ground. I recently saw a lot of apples that had been grown by grafting in place near the ground on seedlings of the common hybrid crabs, and the growth was very satisfactory. While it is well known that the Wealthy and some other kinds take well upon the Virginia and similar hybrid crabs, experiments seem to be wanting to prove the value of Pyrus baccata when root-grafted. SAML. B. GREEN, MINNESOTA STATE EXPERIMENT STATION.

"HORTICULTURAL MANUAL," BY PROF. J. L. BUDD.—The past twelve months have been prolific in works on horticulture by northwestern writers of note in their particular field. The latest one, to which our attention is now called, is the one referred to in the above heading. The full title is "American Horticultural Manual," in two parts, and in its preparation Prof. Budd, of Ames, Ia., acknowledges the assistance of Prof. N. E. Hansen. The first part, now ready for distribution, covers the "leading principles and practices connected with the propagation, culture and improvement" of all kinds of "fruits, nuts, ornamental trees, shrubs and plants in the United States and Canada." So comprehensive a subject must necessarily be treated in a somewhat concise manner in a volume of this size, 12 mo., 417 pages, but being the fruit of the ripe experience of one whose opportunities have been very great and most fully availed of, it will undoubtedly be found a book of high practical value and worthy the closest perusal. The index shows the widest range of subjects, from which those interested in any branch of literature may gain useful knowledge. Price $1.50, and can be had of be publishers, John Wiley & Sons, New York.

The second volume, entitled "Systematic Pomology," "is confined to the classification and description of fruits," including nuts. We understand this list is to differ radically from some of the very full lists heretofore published, in that it is to be restricted to "varieties recommended at this time by societies and growers, including those of special value locally" or "on trial lists of the northern limits of successful fruit growing." This then, in a certain large sense, is to be a practical list, and as such will be heartily welcomed by a large class who live, not "among the antiquities" but in the growing present. Such a select list of present adaptation if judiciously prepared would find immediate use with practical horticulturists. The date of the issuance of this volume is not noted.

E. D. Goff

(See opposite page.)

THE MINNESOTA
HORTICULTURIST.

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In Memoriam.

PROF. E. S. GOFF,

MADISON, WIS.

DIED JUNE 6, 1902, AGED 49 YEARS.

Emmett Stull Goff, professor of horticulture in the University of Wisconsin, died early Friday morning, June 6th. Professor Goff was born in 1852 on a farm near Elmira, N. Y. His early training, like that of many others who have achieved success, was had in the common schools and at the plow handles. In 1869 he was graduated from the Elmira Academy; appointed horticulturist at the Agricultural Experiment Station, Geneva, N. Y., in 1882; appointed professor of horticulture in the University of Wisconsin and horticulturist of the Wisconsin Experiment Station in 1889, which position he held until the time of his death, with increasing credit to himself and the institution.

The equipment of the department of horticulture at the time of his appointment was very meagre, consisting of a very limited plantation of small fruits and office room in Agricultural Hall. Less than a dozen students sought horticultural work at this time. During the past school year over there hundred students received instruction from Professor Goff in a splendid building devoted to horticulture, with the added advantages of field work and observation in several acres of nursery and fruit plantations, containing thousands of specimens and hundreds of varieties. This growth of the horticultural department, although following to some extent the growth of the Agricultural College in general, is due in no small measure to the persistent, untiring efforts of Professor Goff.

His "Principles of Plant Culture," and "Lessons in Pomology," each representing months of hard labor, were the outgrowth of his experience in the classroom. The professors who have built up the splendid course of instruction in the short course were pioneers in the work and were compelled to furnish texts for class work as well as to demonstrate principles. The execution of these two works by Professor Goff was accomplished almost wholly in hours and days that should have been devoted to rest and recreation, leaving him without a reserve force to fall back upon at the end.

Professor Goff's work in the field of investigation entitled him to rank with the leading scientists of the present time. His first important work was a study of the apple scab fungus. In connection with Professor Gallaway he conducted the first successful series of experiments with fungicides for the control of this disease. He was a pioneer in spraying.

The fact is not generally known that Professor Goff invented the kerosene attachment to spray pumps. This device, so commonly known as the "Weed and Gallaway Attachment," was first applied to the old Nixon tripod pump, and the original model is now in the Horticultural Building.

His experimental work, as recorded in the reports and bulletins of the Experiment Station, is remarkably full and valuable. His recent investigations in regard to the formation of flower buds has attracted worldwide attention. While ranking as a horticulturist, much of his work in recent years was regarded with attention and respect by leading botanists. Earnestness and persistent application to duty in spite of ill-health and other obstacles mark his work.

His home life, his church work and his social relations were well defined by these words of his pastor: * * * "A kindly Christian gentleman." Volumes could tell no more. He was a member of the Congregational church and an earnest worker in many causes that aimed at the uplifting of his fellowmen. No such cause in the city, no matter how humble, but received material aid from him.

Kind and considerate at all times, his scholarly attainments, his spotless life, his unswerving honesty of character and purpose, his constant and untiring application to his duty won for him the admiration and sincere affection of his friends and associates, and their inheritance is an inspiration to better lives and nobler deeds.

He leaves one child, a son thirteen years old, his wife having died a year ago.

FREDERIC CRANEFIELD, Madison, Wis.

PLANTING AND CARE OF A FIELD OF RED RASPBERRIES.

F. J. EMPENGER, BEDERWOOD.

In planting red raspberries for profit three things are necessary: first, soil; second, good thrifty plants; and, third, cultivation and care of plants.

Select a piece of well drained ground, and if the soil is not rich enough apply about twenty loads of well rotted barn manure per acre. If fresh manure is used, it should be applied a year before planting. Plow deeply, smooth down, and mark both ways. Some varieties can be set closer than others. I plant mine 5x5 feet. They should stand apart far enough to give them plenty of air and sun. This will make larger and firmer fruit.

I use plants only from young plantations, not over five years old. I would not use plants from old fields if they were given to me, and I were paid for taking them. I tried it once years ago, to save a few dollars, and that once fixed me. I prefer root-cutting plants, as they have more fibrous roots,—but where can we get them? Small sized plants will do if they are from young parents. I take about fifty plants in a bushel basket, wet the roots, and if it is windy weather keep wet moss or a gunny sack over them. I insert a spade in the ground the full length of the blade, push forward and upward, so as to leave a hole of about eight or ten inches back of the spade, hold the spade with my right hand and foot, insert the plant with my left hand, release the spade and dirt, and the plant is set. In this way I set from 1,200 to 1,500 plants per day alone, and if I use a smart boy to drop plants for me I can set double the amount in the same time. I lose very few plants.

When the planting is completed, we start to cultivate at once; we do not wait for the weeds to start first. I use a five-tooth cultivator twice in a row, and the same in the cross rows, once a week. Every third week I change to two-shovel plow, and keep on plowing until the last of August, when plowing should stop for the season, to allow the wood to ripen for winter.

The second year, after the last picking of berries is completed, the old wood should be all cut out and gathered in heaps and burned up. At the approach of freezing weather, the tender varieties should be buried in earth deep enough to cover the bushes to keep them from winter-killing. This may be done by bending the bush as far down to the ground as is possible without breaking it off, throwing a few shovelfuls of dirt on the tops, enough to hold them secure, and, when the field is tipped down, taking a common plow and plowing a furrow against the row on each side. This will leave but very little work for the man with the shovel to do.

HOW TO SELL THE CROP OF THE COMMERCIAL ORCHARD AND GET FULL VALUE IN EXCHANGE.

CARL VOLLENWEIDER, LA CRESCENT.

If any one has a large crop of apples to sell, the first thing he wants to do is to make himself acquainted with a few commission men in Minneapolis, St. Paul and Chicago and have them keep him posted as to the condition of their market. Any man, of course, will keep an eye on his local market and keep that supplied as long as he can not get better prices at a distant market.

The next thing to do to get the most money for his apples is to ship good fruit well packed. The old saying, "What's worth doing at all is worth doing well," is nowhere more true than in packing and selling apples. Pick your fruit into baskets or boxes; then take them into a building and grade them and pack them there. I think it pays well to make two grades of your apples; the second grade will bring nearly as much per barrel as the mixed ones would, and the first grade will bring much more. Seconds can generally be retailed in the local market at a fair price.

Duchess I would pick when quite green and ship them in half bushel baskets. Farmers generally let their Duchess get too ripe before picking; the consequence is that there is always a time when the markets are flooded with a lot of poor, decaying fruit.

Transcendent crabs will also bring better returns if shipped in a small package, nicely graded and hand picked. Crookston, Minn., is generally a good market for them. When it comes to the later apples, such as Wealthy, Longfield, Northwestern Greening, etc., it is necessary to study the apple market in the eastern and southern states. If the crop all over the United States is good, and winter apples are likely to be cheap, it is generally best to sell all but the Wealthy as soon as the fruit is picked. Those I think it pays to wrap in paper and store in a cool building, to ship in October and November. I have noticed there is always a scarcity of good eating apples about that time, eastern winter apples being too hard yet to be good eating. The Wealthy is in its prime then, and people are willing to pay a good price for them.

I do not know much about cold storage, but if Wealthys can be successfully kept in cold storage, they will sell all winter for better prices than would eastern and southern apples. A small package in this case also would be found most profitable. I believe that as soon as a number of large commercial orchards get into bearing in any locality, the large fruit houses will send their representatives to buy the fruit before it is picked, the same as they do south and east of us.

There was a large crop of Baldwins in the New England states a year ago: I was there buying for a La Crosse house, and I was very much surprised to not only find buyers from our western states, but also from Missouri, Kansas, Kentucky and other southern states, which I supposed had plenty of apples.

The demand for apples at reasonable prices is enormous. The population in our northwestern states in the next twenty-five years will double, and I am sure the people's appetite for Wealthy apples will treble in the same space of time. So don't let us worry, the selling of our apples will always be our least trouble. Produce the apple, and the buyer will be at your door.

Mr. Philips: Do you ship the Wealthy in half bushel packages?

Mr. Vollenweider: Yes, I do.

Mr. Philips: How large an orchard have you?

Mr. Vollenweider: I have for a number of years been buying apples within a radius of twenty-five miles of La Crosse. My own orchard is small. I have not shipped many in half bushel baskets; I cannot get the apples fast enough from the farmers. The best way I could do was to first find where I could get the apples and then tell the farmers I would be after them on a certain day, and then I shipped them in barrels. If I had an orchard of my own bearing, I would ship them in half bushel packages, because they will always bring a better price. The farmers are generally at that time just about getting to stacking grain, and they will not take time to take their apples to market or get them ready, no matter what you offer for them; and when they do get ready they will not keep long, and you strike a poor market. If a man has Borovinka or Duchess that come in late he had better wait a little, and then he can strike a good market, but every other year you must ship either early or late.

Mr. Philips: They generally bring them to La Crosse with four or five kids on top of the sacks.

Mr. Blair: The method I have adopted of selling the Duchess is to watch the apples, and as soon as the seeds begin to turn we get our pickers and begin with them. We never wait for them to ripen as the smaller growers do. I usually have mine all picked and shipped before the farmers think of picking theirs.

A standard apple box has been adopted by the Inland Empire Horticultural Association of Washington. The box is to contain 2241 cubic inches of space and will be made in two shapes in order to conform to the different varieties of apples. One size will be 10x-11x20¼ inches inside measure and the other will be 10½x11x18 9-16 inches inside measurement. The official standard adopted by the association is slightly over a bushel. Each box of apples is to be branded "One bushel." The next legislature will be urged to adopt such a standard by law, coupling therewith a penalty for using any other.—O. J. Farmer.

FLOWER WORK IN THE RURAL SCHOOLS.

MRS. M. M. BARNARD, MINNEAPOLIS.

The question that I have been asked to answer here today is, whether after eleven years' experience in the flower work of the Minneapolis Improvement League I could suggest any way in which this work, which has done so much for Minneapolis and for its school children, could be adapted to the needs of rural districts.

I have often wished that the work could be extended in some way that would include all of the children in the state and have thought of many ways, but they all require too much money for their execution. I can think of but one way in which the same general plan of working through the school could be adopted without great expense, and that is for some state organization like the State Horticultural Society, for example, to form a junior department and to add to its monthly magazine a few pages devoted especially to the interests of this department.

In order to make such a department a success, I think the main thing to consider is the welfare of the children and to adapt the work to their requirements, for sooner or later if it succeeds it will resolve itself into that. The primary object of the improvement league was to beautify the city, but very soon the committee in charge found that the moral needs of the children were greater than the aesthetic needs of the city, although the two were so closely bound together that the same means fulfilled both requirements.

For the sake of bringing the matter more clearly before you, perhaps I had better say just a few words about this flower work. As some of you may know already, it is a scheme whereby the school children, the parents, the teachers and the members of the Improvement League all work together for the accomplishment of the object for which the Improvement League stands: i. e., to promote the health, beauty and cleanliness of the city. Our methods have, of course, been adapted to the needs of the children and the city. The best method, we believed, in which we could interest the children was by the free distribution of flower seed; afterwards vegetable seeds were added, and both flower and vegetable seeds distributed to all who would promise to prepare a proper place, whether in the yard or in boxes. When the member wishing to engage in the work has been ascertained, the seed is sent to each school and there distributed among the children. Usually from 15,000 to 20,000 ask for seed each year. The teachers talk to the children about their flowers and the care of the gardens. Each child has a copy of Miss White's little "Culture of

Flowers," and we have in nearly every school a copy of Prof. Green's vegetable gardening. The teachers also help in the inspection of the gardens, making out the reports, which are sent to the flower committee, and in the placing of the rewards.

These rewards are a most important feature. They are in the form of pictures and casts. The pictures are fine, large reproductions of famous masterpieces of art, framed in neat, durable frames, especially suited to the school room. The casts are selected with the greatest care, from among those made by Caproni of Boston and are good enough for any building. These and the pictures are a constant delight to children and teachers. The League has placed over two hundred of the pictures and a number of fine large casts.

Now the question is, how can this work which has been planned with special reference to the needs of city children be adapted to the needs of country children.

We have in the country the same elements—the children, the parents, the school and the teachers; but the conditions are totally different, and the nature of the work as well as the means must necessarily be different. In the country the child has nature all about him—trees, flowers and abundance of space in which to raise plants. He has everything that the city child has not; but the city child has some things that the country child has not—in many cases he has leisure in which to care for his garden—and yet after inspecting hundreds of gardens I do not hesitate to say that the busiest children nearly always have the best gardens. Whatever they have or have not though, the city child and the country child have one need in common, and that is, something that will interest them in the home. something that will bring them into closer sympathy with their parents and with their schoolmates. This something I think can be found in the home garden. But the parents, the teachers and the state organization—let us call it the State Horticultural Society for convenience—must co-operate. The parents ought to be generous and give each child a little plat of ground for his own. Let him put a fence around and let every one understand that the rights of that child are sacred, not only as regards his land but his time. Let him and everybody else distinctly understand that after he has performed certain work, which should be clearly defined, he can have a certain amount of time to himself. I think this is a most important matter, and its neglect is one reason why so many children leave the farm. The way in which most children on the farm are kept at work is enough to discourage any one and make any one hate country life.

Let us sum up the needs of the average child on the average farm, where most of the work has to be done by the parents and the children.

1. Something that will make the home attractive and interest him in the work he has to do.

2. Time to enjoy and profit by this possession.

3. Companionship. Play. Sympathy. Right understanding by some one of his aims.

4. Opportunity for mental growth.

5. Business training—a chance to earn more money for himself.

With these needs in mind I should think that if such a work was undertaken by the State Horticultural Society it ought to include everything for which the State Horticultural Society stands, and the object ought to be to make horticulturists of the very best type out of these country school children. To do that it must meet them more than half way. Offer them a cordial invitation through the pages of your magazine to join the society. Make horticulture attractive to them. Let them know they have your sympathy, and that they are asked to become a part of your important state organization. Offer them special inducements in the form of premiums at your annual meetings and at the state fair. Let them know that all efforts in behalf of horticulture will be recognized and appreciated. Have a few pages of the Horticulturist magazine devoted to topics of special use and interest to them.

Of course, free distribution of seed would be out of the question. The Horticultural Society ought not to be expected to assume such an expense. On the other hand, I do not think it ought to expect to make money by the operation; its reward ought to be of another kind. For that reason I think some such plan as that of the Junior Nature Study Club, of Cornell University, would be excellent. The dues, as you know, are in the form of letters written on topics drawn from personal experience. The magazine is a very important feature of the work, and I should think little clubs of ten in the schools could subscribe for that and have it sent to the school.

I think a generous missionary spirit in the work would be well repaid. We have considered the needs of the children; the needs of the Horticultural Society are not so well known to me. Two needs I do know of, though: one is members—more members, always more members. The other is a seedling apple tree "as hardy and prolific as the Duchess, with fruit equal to the Wealthy in size, quality and appearance, and that will keep as well as the Malinda."

It seems to me that with Prof. Hayes' model garden in the school and with the home garden in which to carry out experiments tried at school, with the constant help and stimulus of a monthly magazine and the privilege of writing to the society and of receiving answers through the pages of the magazine, and with a realization on the part of each child that he is a "really and truly member" of this great and growing organization, results would certainly be evolved that would be advantageous to the cause of horticulture and that would strengthen this society. But what is of more importance than that is that it would bring a new element into the lives of many lonely children.

Of course if all of the children could go to the agricultural school—or would go there—this undeveloped field in horticulture would not mean so much. But they cannot all go—and all who can go do not care to. This scheme would reach them before they have begun to make plans for the future—would help to determine the nature of that future and would doubtless interest hundreds of boys and girls in agriculture and horticulture who would otherwise be drawn in other directions.

Mr. C. M. Loring: I feel a good deal like I used to feel when a boy when I used to go out to my good uncle's in the country; I feel literally stuffed. I wish every member of the society could have heard the paper of Mrs. Barnard. I know the work she has been doing, and I know this thing has done more good than anything else the Improvement League has done. There is one feature I would speak of, late as it is, and that is in regard to a report that was made by a gentleman at Buffalo at a national meeting of improvement associations. A gentleman from Cleveland said they sold their flower seeds. They bought them at wholesale, the ladies put them up in packages, and 40,000 of those packages have been sold at one cent each; and they seemed to think it was really better to purchase the seed and sell it to the children than to give it to them outright; but the report made by the gentleman was about the same, that the children do become interested in it and are largely benefited by it. At Dayton, Ohio, Mr. Patterson, of the Cash Register Co., by very hard work, succeeded in interesting forty boys to work in a vegetable garden, and every one of those boys raised vegetables enough to help support the family, and many of them had enough to sell so they could clothe themselves. The next year instead of having trouble in securing forty boys, the trouble was in getting land enough, because every boy wanted to be a vegetable grower; and those boys worked off their surplus energy in that garden, and there was no more truancy in that neighborhood. I think there is a vast work this society could take hold of. You must begin with the children, and it is surprising how they will take hold of the work, and they will soon learn how to take care of the flowers.

Mr. W. L. Taylor: The lady spoke about the needs of the horticultural society, and one was more members. I believe one way of accomplishing that end is to bring our sons and daughters with us next year. I brought a son and daughter here last year, and they were very much pleased with what they saw and heard. I would like to see every parent bring his sons and daughters to these meetings, and we would soon recognize an increased interest in the work.

THE CONSTRUCTION AND MAINTENANCE OF CEMETERIES.

A. W. HOBERT, SUPT. LAKEWOOD CEMETERY, MINNEAPOLIS.

In this progressive age it would be strange, indeed, if new methods did not prevail in construction and maintenance of cemeteries as well as in other lines of work, yet when I visit the cemeteries throughout the country I am surprised that intelligent and well to do communities should allow their burial places to become so dilapidated and forlorn in appearance as the majority of them are. Although the past ten years have brought about marvelous changes for the better, there is still vast room for improvement.

In planning a new cemetery the first thing to consider is location. The ideal cemetery should be on a high piece of land, with gravelly or sandy subsoil and good black soil and clay surface, slightly rolling, near enough to the city to be of easy access and, if possible, on a street car line.

In order to produce the best effect the ground must be carefully studied as to topography, surroundings, soil, etc., bearing in mind that the future of the place may be made or marred by the very first work done.

We will first consider the location of the drives, which should, as far as possible, follow the natural contour of the ground, occupying the low places, thus allowing easy and natural drainage. A mistake too frequently made is that of building too many drives. My experience goes to show that the sections except in very small cemeteries should not contain less than three acres, and if the contour of the ground permits may be made much larger.

The grade of the drives must conform with the surrounding ground, and if level or nearly so just enough topsoil should be removed to make room for the road material. If sandy soil one foot will be sufficient, but if clay soil enough must be removed to allow for from six to ten inches of sand under the finishing material, thus providing under-drainage, which is very essential. All drives should be at least twenty feet wide, the center to be crowned

from five to six inches above the gutter grade, bearing in mind, however, that on a hillside the incline from center to gutter must be greater than on level ground, in order to prevent the water from accumulating and forming a gutter or gully down the center of the drive. The surrounding lawns should be sloped gently down to the gutter, care being taken to make no steep terraces where avoidable.

In selecting material of which to construct the road, one will have to be governed by location. If convenient to stone quarries, the refuse rock is as desirable a material as can be procured. I am at present building a piece of road in Lakewood using rock usually thrown into the dump at the quarries. This is hauled and dumped onto the subgrade, then broken with hammers into pieces about three inches square. This course I make four inches deep at the gutter line and eight inches in the center. Next I haul coarse, sharp sand and wash as much of it as possible down between the broken stone, and then go over the road with a heavy roller. Next comes a course of from two to three inches of stone crushed to about inch cubes, and another flooding of sand and rolling. Following this is the final coat or dressing of one-half inch of stone screenings (screened gravel may be used instead for dressing, if desired). If stone can not be procured at a reasonable cost, cinders or slag will make a good substitute.

In case there are no subdrains to carry off surface water, it will be necessary to build gutters wherever the grade is very steep. These may be constructed of cobble stone, cut stone blocks or paving brick, laid eighteen inches wide to the contour of the road, on a base of sand, and well rammed. Where it is possible, there should be a complete system of drainage provided and proper inlets from the gutter at frequent intervals along the drives into the same.

After outlining and grading drives, all land should be plowed and brought to a uniform surface with scrapers, care being taken to save all the top soil which is necessarily removed, to be used again on the surface. Stir up the soil well with harrows, remove all sticks, stones and roots and sow with pure Kentucky blue grass seed, about four bushels to the acre, rolling well with a light roller immediately after seeding and again when grass first shows through the dirt. Let the grass get six to eight inches high, then cut with scythe two or three times before using a lawn mower. This method should give in two years a fine, close lawn, which will last indefinitely if properly cared for and a little new seed applied occasionally in August.

We now come to the item of planting trees and shrubbery. At Lakewood we use largely the native shrubs from the woods for screens and borders, while the more ornamental ones are used for grouping throughout the grounds. A great tendency exists among people interested in cemeteries to plant too much, thus shutting out from view many beautiful features, and for this reason all planting should be under the control of the management, and a plan formulated for the same which should embrace the entire grounds. There is such a wide diversity of opinion as to what constitutes judicious planting, that this feature should be placed in the hands of some practical cemetery man to work out.

Next we come to platting the sections into lots, and here is a point which must be governed by local conditions entirely. The generally accepted size for family lots is from 15x21 to 18x21, although we plat them as small as 9x10 for four burials and as large as 40x40 in our regular plats, and of an area of several thousand square feet on special sections. Probably the demand would be principally for four, six, eight and ten burial plats. In addition to the family lots a place must be provided for single burials, where strangers can be placed and temporary burials made.

Regarding maintenance of cemeteries I would say that a properly constructed cemetery kept clean is well maintained: roads must be free from weeds and loose stones, borders well trimmed, and the grass cut close and well raked.

One of the most important features to be considered in starting a new cemetery is the rules governing the erection of stone work. All really modern cemeteries prohibit the slabs and high headstones which we see in older cemeteries, and permit the erection of but one stone on each lot which shall project above the surface of the ground, this to be the family monument, all individual stones being set as tablets with their surface on a level with the surrounding ground. This leaves on unobstructed view across the sections, save where broken by the trees, shrubs and monuments, and adds greatly to the ease and economy of maintenance. No fences, copings, lot marks, or corners or, in fact, anything to outline a lot should be permitted. The work of building all foundations should be performed by the management, as should be the setting of monuments and markers.

In closing I would speak of the necessity of providing a permanent maintenance fund. This should be done by setting aside a certain amount for every square foot of ground sold, this fund to be placed in the hands of trustees selected for the purpose and

the interest only to be used. This insures purchasers of lots that their burial places will be well maintained after they have gone to join the silent majority.

Accurate records of all interments should be kept, also a record of all sales, as well as the regular classifications of labor which show the expense and net income of each item of the labor account.

I do not feel that I have in this paper covered the ground as fully as I might had I more time allotted me, but trust that some one may be benefited by what I have written.

Mr. L. R. Moyer: The only criticism I have to offer is that for rural cemeteries macadam is too expensive. Is there not something cheaper?

Mr. Hobert: I made the suggestion that slag or cinders would make an admirable substitute for the macadam. We have some gravelled roads, although we are discarding them as rapidly as possible.

Mr. Oliver Gibbs: Down where I live the farmers get all the cinders from the railroad stations to feed to their hogs. Perhaps a special arrangement could be made to get a quantity to put on our roads. I want to say one word on cemeteries. I have no criticism to offer on the paper, but I may not be here to say again what I have to say. Our whole system of cemetery construction is barbarous. The burial of the dead should be more in conformity with nature.

Mr. D. T. Wheaton: What would Mr. Hobert say about setting five or ten acres?

Mr. Hobert: It is a difficult matter to say just how thick they should be set. You must consider there are other purposes in mind than the actual beauty of the place. You have to consider the number of graves on the ground and the amount of ground left. There ought to be certain spaces restricted to planting, not necessarily trees, but some herbaceous shrubs and plants. Too many trees spoil the ornamental work. The tendency is for people to plant a tree on each corner of the lot and one in the center. If any planting is done it ought to be well done.

Mr. Wheaton: It is in regard to tree planting on every lot that we have most of our trouble in our rural cemeteries. I have charge of a rural cemetery, and I know that the tendency is to plant trees on every lot.

Mr. C. M. Loring: Carlyle said that a community could be judged by the character of its cemetery. In passing through the country we all see these local burying grounds, and we also see many peculiar looking monuments. I would like to say here that when you are so unfortunate as to have death come into your family, and you are obliged to find a burial place, pretty soon along comes a monument man with a lot of pictures—and I want to say to you do not be humbugged by these things that are turned out by machinery, which lack taste more than is found in anything I know of that is being manufactured. Put up a simple block of granite, a simple headstone, but do not allow these men that come around

with metal monuments or turned monuments to make your grounds look as do many of those that we see all over the country. It is just as well to have a neat little stone of granite as to have those monstrosities. I wish it were possible in the arrangement of cemeteries to prohibit the placing in the grounds such monstrosities as we see all over the country.

Mr. A. J. Philips (Wis.): I just want to say one word in reference to the driveways through cemeteries. In the place where I live the ladies took hold and improved the cemetery, and it is very nice. The railroad company gave the cinders, but after four or five years they discovered that the drives were not satisfactory, grass and weeds would come up through the cinders, and it was hard work to keep them clean. They had those drives all cleaned out and put in macadam. We have a stone quarry in town, and it was not very expensive, and it makes a splendid drive.

Mr. Bush: I think here is one of the grandest opportunities, for these local improvement societies to begin on the rural cemetery, and they will be largely under the supervision of the ladies, and generally when they get their work started in the cemeteries and improve the grounds they will continue that improvement in the homes and on the school grounds.

The President: I think there is a great mistake made in putting these monstrosities into our cemeteries, as Mr. Loring has said. Hardly any other construction can be placed upon it than that they do it for the mere purpose of show and pomp. They take all sorts of liberties in the ornamentation of these quiet cities of the dead, merely because the residents cannot get up and protest for themselves, no matter what is done. I think the more modesty we show, the more that we do that shows that we cherish a loving remembrance of those that are laid away there the better, but in so many instances nine out of every ten dollars are merely spent for show, and I, for my part, do not believe in it.

Mr. Wyman Elliot: "I hope that every member present will make up his mind when he gets home that he is going to put into practice what he has learned here, not put his knowledge under a bushel, but spread it out and let his neighbors know what he has seen and what he has learned and try to induce them to become members of the Minnesota Horticultural Society. We have passed the thousand mark, and next year we want to pass the twelve hundred mark, and if the right kind of work is done by our members we can do it very easily. It is a very easy matter to influence a man to something if you approach him right, and the best way to do it in this instance is to take your monthly magazines and distribute them to your neighbors after you have read them. You get the bound volume at the end of the year, and after you have read your magazines and have taken any references out of them that you wish you can give them to your neighbors and let them have the advantage of reading them, and above all try to induce them to join us."

VARIETIES OF APPLES FOR THE COMMERCIAL ORCHARD.

J. A. HOWARD, HAMMOND.

In the selection of varieties for a commercial orchard, it would depend somewhat on the location, soil and whether you have a good home market or have to depend on the cities for the sale of everything. In the first place, I would plant varieties that are early and heavy bearers, as apples on young trees are larger, smoother and will sell better in the market.

My Borovinka have paid me better than anything that I have in the orchard, as it is an early and annual bearer. All things considered, the Wealthy is the best apple we have for the commercial orchard, but if the Patten bears everywhere as it does with me it is a close second. The Longfield is the earliest bearer we have, and for the home market with me it sells well.

As far as my experience goes, any one planting a commercial orchard will make no mistake in planting the varieties named.

There are a great many more varieties worthy of mention, but these I consider the most profitable.

Mr. Lord: Mr. Howard recommends the Borovinka. I do not believe that the great majority of the members of the society understand that the Borovinka and the Duchess are almost identical. Perhaps they do. I did not until a short time ago, although I pay some attention to fruit growing.

Mr. Cutler: I think Mr. Howard does well in recommending few varieties. I live in what we call the great potato belt, and we find it is profitable to raise but five varieties. It is so with apples; if you set out a commercial orchard you want to confine your varieties so you can make up a carload of two or three kinds of apples.

Mr. C. H. True: I would like to ask why Mr. Howard has not recommended any winter varieties? I wish he had recommended a few winter varieties. I believe he has on exhibition the Malinda and the Northwestern Greening. I wish he would name some winter varieties.

Mr. Howard: With me the Northwestern Greening shows the best of anything I have in the orchard. I have had it two or three seasons, and it is showing up in splendid shape, both the tree and the fruit.

Mr. R. H. L. Jewett: I would like to emphasize the value of the Patten Greening. I find it is a prolific bearer, even in excess of the Duchess, and we have it in bearing only two years. I have a little photograph of a Patten Greening tree with me which I will pass around. This tree was set in 1897; it is only four years old, and last fall we picked a half bushel of apples from it.

Mr. Frank Yahnke: I think there are new varieties better than the Ben Davis, but as they grow on my place at Winona I

think they are good. They are a nice red, fine looking apple, and the boys on the streets sell them more readily than any other apple. Then another good thing about it is that you can't kill it. If it kills down, it will grow up again and bear fruit.

Mr. Seth Kenney: A great many years ago this society recommended the Ben Davis as ironclad. I bought three hundred trees, and the winter of 1884-5 killed out every one of them. I don't want any more Ben Davis in mine if I know it.

Mr. Yahnke: My Ben Davis were killed in that winter of 1884-5, but the same trees that killed down that winter bear the best fruit now. If those who have Ben Davis would take the ax and chop them down and then let them grow up again, they would find they had the best kind of trees on the place. I took the ax and chopped down all of mine, and they have been bearing for years and years from three to five barrels of apples.

Mr. A. J. Philips (Wis.): Mr. Kenney was unfortunate. There are some of us fellows that attend these meetings that knew so much, and we did not want any more Ben Davis. The men who planted Ben Davis in 1886-7-8 are the men who have made the most money out of their trees; trees that bore from ten to fifteen bushels each, which they sold for a dollar a bushel. We fellows that knew so much about it, because we thought they would not stand the winter missed it. The men who set them in 1886 to 1888 are the men who are making the money now.

Mr. Wyman Elliot: I want to call your attention to what was the result of that killing of 1885. We all recollect what our experience was with the Wealthy in that year. Mr. Dartt had over two thousand Wealthys, and because they killed down that winter he grubbed them out, and he admits that he lost thousands of dollars by so doing. The Ben Davis are standing fairly well, and so are the Wealthy, and I think the Ben Davis is nearly on a par with the Wealthy in good locations. It will not stand in all locations; I do not think it will stand in many locations, but if I were to plant an orchard on clay land on a high elevation I should put in a sprinkling of Ben Davis.

Prof. Hansen: About the Ben Davis, there is some valuable experience I wish to quote here from Mr. E. D. Cowles, of Vermillion, S. D. He said, in the southern edge (of South Dakota) we can raise Ben Davis as a bush but not as a tree. It is successful in the southeastern part of the state for a strip of from ten to fifteen miles along the Missouri river. I think if this society recommends anything for the farmer on the prairie, they had better not open the door for the Ben Davis in any shape or manner. Better not recommend any winter variety at present; we may have another 1884-5 winter by and by.

Mr. C. H. True (Iowa): We had Ben Davis where the roots were killed but the body was sound.

Mr. O. F. Brand: I have had no courage since 1873 to plant Ben Davis. I lost thirty thousand in 1873; all the orchard trees killed out, root and branch. I have only seen two Ben Davis since 1884 that came up from the stump.

Mr. Yahnke: This root-killing of the Ben Davis was not due to the Ben Davis itself, but it was due to the stock upon which it was grafted. I have Ben Davis on their own roots. Every tree of those Ben Davis in the nursery not on their own roots died down to the ground, but those I had in the nursery that I started from the scion all lived, and those I planted. If you plant the Ben Davis you want the tree to take root from the scion. If you will take the trouble to have a short root and a long scion and then plant them deep you will get ninety per cent on their own roots, and if you get Ben Davis on their own roots it will take something worse than a Minnesota winter to kill them out in the roots. But you have got to grow them bush form, and you will have a good bearing tree that will please you.

Mr. S. D. Richardson: Perhaps the cutting down of the tree has a little something to do with the sprouting from the roots. I have seen cottonwoods chopped down in the winter that did not come up again.

Mr. Kenney: I would like to inquire if it is not generally understod at this time that the common apples grafted on Siberian crab root is not more certain to live than if put on apple roots. I would like to have some information on that point. I suppose Prof. Hansen can give us some light.

Prof. N. E. Hansen: This question opens up a large field for discussion and experiment. Some problems yet unsolved must first be solved. As already stated in Bulletin 65 of the South Dakota Experiment Station, the early experience in Wisconsin and Iowa indicates that piece root-grafting is not advisable with the crab root. Neither is top-grafting on Siberian crab limbs advisable in the long run. The whole root—everything beneath the surface of the ground—should be Siberian for a fair test of this hardy stock question. This method has proven successful in Russia and has solved the root-killing problem there. Dr. Lucas, a noted German authority, also mentions the Pyrus baccata (pure Siberian crab) root favorably for severe soils and situations. A letter I received this year from a nurseryman at Moscow, Russia, says this crab stock for the apple causes earlier fruitfulness, smaller tree in orchard, and is of superior hardness, but is not necessary where they are always sure of snow covering for the roots. In southern Russia, where they can grow French pears, they use common apple seedling as stocks for the apple. I have tried seedlings of Duchess, Hibernal and many other apples, and all root-killed in the winter of 1898-99. Seedlings of the native wild crab, from Des Moines, Iowa, winter-killed also. Long scions and short roots on common apple seedlings fail with me in severe winters, even scion roots of Hibernal, Charlamoff, Duchess and Wealthy. In fact, we must recognize the fact that for a considerable area of the Northwest we must go entirely outside of the common apple species, Pyrus Malus, for a hardy stock. The severest cold sometimes comes with no snow on the ground. As for the practice of piece-root-

grafting in general, I heard more objection to it from European horticulturists than I have ever cared to report until more experiments were made along this line. Certain it is that a two-year budded tree will usually averag- favorably in size with a three-year grafted tree, because the seedling is already established and can push the bud in stronger growth from the start than can the piece-root-grafted tree, where the graft must first take root itself before making a strong growth of top.

A word about partial root-killing. There is some reason to suspect that there has been more or less trouble from tender roots every winter, causing early decay and short life. It has, in truth, been the "worm at the root of the tree." It is barely possible that the use of hardier stocks will change our opinion of the hardiness of some varieties now rated as being of the second or third degree of hardiness.

As to the best crabs to use for stocks, whether the pure Siberians or the hybrids, that is an open question. At the far north the pure Siberians will probably be better; while further south where less hardiness is necessary, probably the hybrids will be better.

H. L. F. Busse: Some growers take pains to know what kind of roots they use, and others take anything they get. Get good varieties and get them from honest nurseymen, as near home as you can, with good roots, and set your roots deep enough. Do not plant them shallow, but set them deeper than they stood in the nursery. In 1884-5 I had Wealthy that were set out in 1881, and more than half of them killed out. A very good place to plant them is on a northern slope where I had mine. I noticed that those trees that were set shallow all killed, and those that were deeper set killed down to the snow line, and most of those I grubbed out. I was so discouraged I just hated the Wealthy, but those that did sprout again did well. You take any tree that is set shallow, and it will not stand. Some four or five years ago I set one hundred and twenty-five Wealthy, and they all grew. They were double-worked Wealthy, of the late Mr. Pearce. They all grew except one; but the next winter we had very little snow, and they all killed except eighteen. I took pains to cover some up, but they were all killed root and branch. If I had set them a little deeper, and they had stood another winter, they might have come through all right. Two years ago I noticed some trees were root-killed, but those set deeper on the north slope were not killed. Those trees like Duchess, Hibernal or Virginia you will never find them killed. I set trees now from four to six inches deeper than they stood in the nursery, and the next year I draw up more soil, so they will make their own roots.

AN ORCHARD EXPERIENCE OF ONE-THIRD CENTURY.

ANDREW WILFERT, CLEVELAND.

Progress, the watchword of the nineteenth century! Progress, in every branch of industry! Even the backwood's farmer is furnished not only a cheap newspaper, but he can sit and read by a gas lamp about the nice fruit that was on exhibition at the state fair.

I am a farmer. From my earliest recollections I entertained the idea that no farm was complete without an orchard. In 1856 I came to Minnesota, and I found the most exuberant vegetation I had ever laid eyes upon; I did not imagine an obstacle existed that would hinder us from raising fruit trees.

As soon as I had a piece of land that I could call my own I wrote back to Indiana for apple seeds. They grew, but winter-killed to the roots nearly every winter.

In the fall of 1865, when I came home from the south, I bought 100 trees that had been grown near Garden City, Minn., purported to be perfectly hardy. Two of them lived long enough to produce a few apples, then winter-killed.

The same fall I bought a barrel of Ben Davis apples. Every seed in them was saved and planted. Over 1,000 germinated. In the spring of 1867 I found about one-third of them winter-killed, root and branch; the most of the other two-thirds had winter-killed to the ground. I took care of them for four or five years, and then I left them in disgust. In the spring of 1872 I concluded to grub them out. While at work I found one about six feet high and as straight as a whip stock. I could see that it had always started to grow from the very tip, and so I set it out. In 1876 it produced three apples. In the fall of 1879 Captain T. G. Carter, from St. Peter, came to my place and saw the tree with about one-half bushel of apples on it. I informed him that they were a winter apple, and he pronounced the tree the most valuable tree in Minnesota. He took a few of the apples to the winter meeting of the horticultural society. Martin Cook, from Rochester, Minn., proposed to me to exchange scions; he had what he claimed hardy kinds. I exchanged with him on condition that he should not dispose of any young trees from my scions without my consent or on such conditions as I might impose. The scions I got of Mr. Cook were carefully grafted on Transcendent trees, but none of them stood our winters.

In 1884 I had 700 apple trees on my place; in the spring of 1885 I had twenty-one alive, as follows: my seedling; out of 100 Duchess trees, nine; out of 100 Wealthys, nine; out of twelve

Haas, one; out of six Minnesotas, one; out of 200 Ben Davis that had been top-grafted on Hislop and Transcendent not one survived; all other kinds except a few Transcendent were killed.

In the fall of 1885, after gathering six bushels of apples from my seedling, the hogs undermined it, without my noticing it, and when the spring of 1886 came I found my seedling tree dead. That gave me the blues the worst kind. I had then paid out for fruit trees over $1,000. I wanted to sell out and leave the state, but as luck would have it no buyer came. I pondered. Then I began to set out more apple trees, and have been planting some every year since.

I did not hear from Mr. Cook after he acknowledged the receipt of my scions. A year ago last October I called at a house to renew some insurance, and the lady of the house brought in a dish of apples. As soon as I got my eyes on them I felt as a person does meeting a long lost friend. I inquired where the trees came from. The answer was, "They came from the Rochester Nursery"; were set out in either 1883 or 1884. The trees are now twenty-two years old, are in a healthy condition, from sixteen to twenty feet high, and the tops cover a space of ground from sixteen to twenty feet. One of the trees, one foot above ground, measures thirty inches in circumference.

Apparently Mr. Cook's successors did not know anything about our agreement; the trees were labeled by guess and sold. Six of those trees were bought and set out seven miles from my place.

Last winter I cut scions from those trees, sent some to twenty-seven different parties in Minnesota, Iowa, Dakota and Manitoba, and top-worked them on some sixty of the smaller trees in my orchard. The question arose in my mind, why did my seedling and some of the Duchess and Wealthys survive the cold winter of 1884 and '85? The ground, location and other conditions were all the same. The difference must have been in the roots. The roots of these trees were endowed with those prerequisites necessary to endure the cold during such winters as those heretofore mentioned.

Mr. Wilfert: I promised some of my friends to show them how I do my grafting. I am not a nurseryman, but I have been in the orchard business since I came to Minnesota. I heard some nurserymen remark that if they had thirty-three per cent of their grafts grow they were fortunate. A year ago I grafted one hundred, and I saved ninety-eight trees. I will tell you the way I do it. In the fall I get some sand and put it in the cellar, and in the spring when the time comes to cut the scions I cut them and store them. When I put up ice in the winter I leave out a block in the top layer. The blocks are twenty-two inches square, and I

have a box eighteen inches square. I put the box down in the space left vacant by the block of ice. I put about two inches of sand into the box and then lay in my scions on the sand, then some more sand and more scions until I have as much as I want; then I cover up the box, which is a foot deep, and as the ice is nearly two feet thick I get ample covering. When the first of July comes those scions are just as dormant as the day they were put in. I take the scions and go to the tree I wish to graft. Most of the fruit I had on my place last fall was grafted on wild stock. I cut off the top, then take my knife and split the bark, and at that time the cambium layer is forming, and there is a sort of mucilage under the bark. I do not cut it straight, but I cut it somewhat slanting. Then I take a goose quill and sharpen it in the shape of a toothpick. I loosen one side and then run the quill under the bark, which is lifted up to admit the scion, and then wax it over and tie a string around it or use cloth. In twenty-four hours I had a graft shove out a quarter of an inch. Three years ago I had one tree that was grafted on the 24th of July, and when frost came it had shoved out four inches. One thing we do not want to forget; after they are grown together, say in about two weeks, we must go around and cut that string. If it were not cut it would injure the graft.

Mr. Philips (Wis.): Do you do that work both in June and July?

Mr. Wilfert: I do it usually about the first of July.

Mr. Philips: You just loosen the bark and do not cut the wood at all?

Mr. Wilfert: No, I don't cut the wood at all.

Mr. Philips: Well, I suppose it amounts to the same thing in the end.

Mr. Wilfert: I have a different way of grafting apple trees than most nurserymen have. I top-worked fifty or sixty last spring. I had some Duchess I wanted to put my own seedling on. I sawed off the top, and on most of them I split the body and then made a wedge and put it in in the usual way. With some of them I took a saw and sawed in a distance enough to admit the scion, then I took my knife and drew it along on both sides to cut out the sliver to get a smooth edge on the bark, then I made a little chisel and dug out the chips, then took my scion and put it in. Of course, if a man has more than two or three hundred grafts to set he can't do it. I see a great advantage in this method. By the old way of splitting and budding it admits water, and in a few years the wood begins to decay; but in this way with a rag tied over it heals over at once. Mine are all grown over, and I consider this way a great advantage over any other. By the other method you must necessarily have a weak spot, but in this way it grows perfectly sound. It makes it stronger against wind and better in every way.

Mr. Elliot: There is a little matter connected with this paper that perhaps needs explanation. As chairman of the committee on seedling fruit exhibits this matter was brought to my attention

yesterday. There is some criticism in regard to this seedling apple, and the committee wants to be placed right. I have watched very carefully the reading of this paper. There seems to be a missing link between the time these scions left Mr. Wilfert and the time those trees were received back and planted, and there is such a great similarity between this seedling and Plumb Cider that we have taken all the pains possible to get all the expert information obtainable in regard to this apple that is on exhibition. Mr. Patten is very well acquainted with the Plumb Cider, Mr. Yahnke worked for Mr. Plumb during the time this apple was propagated and is therefore quite familiar with it, and there are others here that are pretty familiar with Plumb Cider; and comparing Plumb Cider with this apple in seed, flesh and the formation of the calyx—and by the way, Prof. Hansen is authority in the study of the calyx—if this seedling is not the same, something has been reproduced identical with the Plumb Cider. We did not want to misjudge this apple, and we thought it was necessary to make this explanation so that as far as this committee and the horticultural society as a whole is concerned we should go on record in the right spirit.

Mr. Wilfert: I will offer to furnish all the scions that any one wants and let them graft those scions and the Plumb Cider on the same tree or close together, and then probably they can understand the difference. I have found trees that have apples, and there were three or four of the apples here yesterday, that look just exactly like mine, but when you come to examine it closely the tree looks like the Minnesota, and mine looks like the Duchess. There are probably some of the members here who are familiar with the Plumb Cider and can tell me what the foliage of that tree looks like. Mine is a very large leaf, a thick, very rough leaf.

Mr. O. F. Brand: I have grown and fruited the Plumb Cider for a number of years. I thought I knew the Plumb Cider, and I drove over to Mr. Wilfert's place to see the trees and to see and judge the apples, and it never entered my mind that it was the Plumb Cider. The trees do not look alike, and the apple does not at all suggest to me that it might be the Plumb Cider.

Prof. Hansen: It happens the same way with new melons. For instance, some one in some other state a thousand miles distant originates a new melon, and some one here originates a melon exactly like it. The first man gets his on the market first, and the second man a year or two afterwards; and it often happens that the second man is too late in getting his seed on the market because his fruit so closely resembles that of the first man, and it is regarded as the same thing. So it is with apples. If you have anything new you had better get it on the market as quick as you can because that same formation may appear in another place a thousand miles away. You cannot tell them apart, and so there is no need of putting them both on the market. A man who comes upon the scene five or ten years afterwards with the same variety apparently usually gets left, because the two varieties are considered as the same thing. It happened so in the case of water

melons; when the hard shelled Kolb variety came on the market the same thing appeared at another place, so nearly alike they could not be distinguished apart.

The President: If there is a difference it can easily be determined hereafter by taking one hundred of the Plumb Cider root grafts and one hundred of Mr. Wilfert's, putting them side by side, then note all the points of difference if any exist, the habit of growth, the coloring and appearance of the foliage and then the appearance of the fruit. Then place the apples side by side and see which keeps the longest; see where there is any difference in the taste, and then if no difference can be discerned you can say that the two varieties are identical, but if there is any difference then you have two different varieties.

Mr. Yahnke: I feel a great interest in the Plumb Cider apple because I worked at the place where the tree originated. I was familiar with the old tree and ate apples from it, so I am very much interested in it. This apple of Mr. Wilfert's resembles the Plumb Cider so closely that I believe it is almost impossible to tell them apart. I have seen the wood from that tree. It resembles the Plumb Cider and the Ben Davis very closely, the only difference being in the spurs. The Plumb Cider has no spurs and the Ben Davis has. The graft from Mr. Wilfert has no spurs. I would be glad to get scions, and I will graft them and the Plumb Cider, and in that way we can soon find out if there is any difference.

Mr. Wedge: As a member of this committee I would like to say a word. We were very sorry to be compelled to take the position we did because Mr. Wilfert has been very kind to the members of the society in distributing scions, and we appreciate his efforts very much; it was only through the feeling that we must do justice, let the blow fall where it would, that we came to our own present conclusion, and we shall be very glad to change our opinion in the future if any evidence is introduced that Mr. Wilfert's seedling is a new one.

Mr. Kenney: I am not acquainted with the Plumb Cider apple, but I went up to see Mr. Wilfert's trees, and they appear to be very much like, although a little more spreading than, the Duchess. I know they sold all they could spare at $1.50 per bushel and could have sold more at the same price. I would like to know how the Plumb Cider compares in price.

Mr. Gibbs: It is not at all improbable that this is something entirely different from the Plumb Cider, although the difference may, perhaps, not be readily distinguished. You remember the Pewaukee apple is a seedling of the Duchess. I found a seedling in Wabasha county that had been growing fifteen years before the Pewaukee was originated, and Mr. Peffer identified it as the Pewaukee until I laid the evidence before him to the contrary. So we must not be too sure about what we think we know about these things. Mr. Peffer came to the conclusion that the Pewaukee was a seedling of the Duchess, and the Duchess having been grown nearly two hundred years, the seed of this tree having been brought from central New York where the Duchess originated, he thought

that through some process unknown to us nature through the Duchess had produced two different apples so near alike that as good an expert as he was could not tell the difference.

Mr. Philips (Wis.): I want to say in answer to Mr. Kenney's question that the Plumb Cider is more of a spreading tree than the Duchess. That is its appearance. Mr. Wilfert has offered to send me scions of his tree, and I have a neighbor who has some very fine Plumb Cider. I have promised to send Mr. Elliot some scions to try, and I will send them to any other member who wishes to experiment. I wish those that want to try two or three scions would let me know.

Mr. Richardson: There was a seedling that originated near Winnebago City from which Mr. Harris sent some apples to the pomologist at Washington, and he declared it was an old eastern variety, but I know the tree originated at Winnebago City.

Prof. Hansen: Every man has a double somewhere in the world. If he was not born a twin, yet there is some one in the world from whom you could not tell him apart. So every apple has its double. Why not?

Prof. Green: We did not come to this decision without going over this matter very carefully, and the evidence was so conclusive, and the evidence of many parties was so positive that we could do nothing else, although, as I say, we went over all the evidence very carefully indeed. We did not want to be unjust, and we felt this way about it: We knew something about the origin of the apple which Mr. Wilfert identified after having lost it. We asked Mr. Wilfert about the shape of the crown, and he said later on, it forms a spreading tree. This about coincides with the Plumb Cider. Then we went over the calyx. Prof. Hansen says the Plumb Cider is very easily identified by the calyx, and he stated what it should be before we cut the apple, that it should be very narrow, and when we cut it we found it just so. It has a large core which corresponds with the Plumb Cider. We felt that Mr. Wilfert had identified it, and that our identification was possibly as good as his. We said, if there are two varieties so nearly alike as this it will not do to introduce it in cultivation, as we could not award a premium not knowing whether there existed any difference. I think the matter had better be taken up next year by some new committee, have them compare it with the Plumb Cider, and then we can come to some definite conclusion, but at present we must take the stand we have taken.

Mr. M. Cutler: "I will say that although I have been a member of this association for a great many years it is several years since I have attended any of the meetings. I find there has been quite a change in the membership. When I first attended these meetings I saw nothing but old and middle aged men, but now I see a good many young men. We used to be trying to find out how to raise apples in this state, now they are trying to find the best way of getting the apples from the trees and marketing them, so I think we have made great advancement. I hope to meet with you oftener hereafter."

MINNESOTA'S GREATEST OPPORTUNITY IN FORESTRY.

H. H. CHAPMAN, GRAND RAPIDS.

Great opportunities come but seldom in the life of individuals or of communities. Much as has been said of forestry of late, few realize that Minnesota is just now trifling with an opportunity which eastern states have lost, and which if wasted will not recur. This opportunity, for our own state, lies in the handling of the Chippewa Indian reservations about Leech and Cass lakes. The proposition to embrace these regions in a so-called national park, and the violent opposition to the plan as originally understood, has resulted so far only in indirect good. Through the interest which has thus been aroused, many people have come to a better understanding of the meaning of the word "forestry." Some have even realized that, should the principles of forestry, about which most of us have still such shadowy conceptions, be applied to the management of those forests, most of the timber would in course of time come under the axe of the despised lumberman.

But if forestry is not the preservation of forests, we ask, what is it? True forestry is true forest preservation by use and renewal. The forestry that seeks only to protect the trees and thereby condemn them to decay and prevents proper reproduction, is not forestry but senseless waste. Lumbering, at some stage, is the first requisite of forestry, without which it cannot exist. But forestry is more than lumbering. To the lumberman a forest is a mass of material, to be moved as cheaply as possible. To the forester it is a community of living trees, capable of reproducing themselves and perpetuating the forest forever,—and to this end he shapes his plans. That the lumberman's standpoint is one of dollars and cents is not remarkable. What other business is there which is not conducted from this standpoint? And the frequency and ease with which the balance comes out on the wrong side of the ledger in logging should be better understood by critics of the reckless methods so often condemned. These same critics forget that the industries dependent on the forest employ more men than any other industry except agriculture. And they are usually unaware of the fact that forestry means the application of the same principles of business economy in the handling of the lumber, and differs chiefly in planning for the future forest and not for the present profit alone. And it is safe to say that no park movement which would sacrifice to pleasure material of vast economic importance to the community could succeed, as it would be a direct violation of the law of greatest good to the greatest number.

This has not been the aim of those most truly interested in the movement referred to, but such ideas have been either wilfully or ignorantly ascribed to them.

To any state or community, the problem of the best use of all her resources is second to none in importance. Minnesota, no matter how rich, cannot afford to let poor, sandy, or rocky, hilly soil when stripped of timber remain barren. But this is what is taking place, and under present conditions it seems unavoidable. Such lands will grow timber. There is no land in the state too poor to grow trees if well drained and well watered. Most of the land from which pine is cut, would, except for fires, come up again to pines. That this is true can be proved by thousands of instances in northern Minnesota. That the pine does not restock the land is due almost entirely to the fires which begin with the blaze through the slashings, and usually recur at intervals of two to five years on cut-over lands. Tender seedlings of white and Norway pine if they escape the first are destroped by subsequent fires. Crooked or defective trees left from logging might continue to supply seed, but these too are usually killed sooner or later. Again, the soil just after the cutting is free from grass, weeds and brush, and the young pines which at first grow slowly have an even chance, but with every year the worthless undergrowth becomes thicker until the chance for small pines is very poor. The golden opportunity for renewing the pine is just after the old stand is cut, and even this will prove of no avail unless the fires can be kept out.

But how is the state of Minnesota to prevent fires from burning over the vast sparsely settled tracts of cut-over lands, which are the very regions that, on account of poor soil and inacessibility, should be the ideal nurseries of the future pine forests. Our fire law is probably the best in the country and is well enforced. But even if the few inhabitants of such localities desired to prevent and extinguish all fires (which ideal condition we may not hope for), they would have neither the time nor the force to accomplish it. No fire law which has to depend for its enforcement on local help and local political officers and operates over the confines of an entire state, can be absolutely enforced. Only such fires will receive attention as in the minds of the residents endanger personal property. Small ground fires in waste places, which do the lasting damage to the future forest growth will be utterly neglected, for the expense of handling them, will, in the local mind, be offset by no adequate compensation. There is but one reasonably sure way of preventing fires; by the patrolling of certain well defined tracts by a force of men

under the immediate control of some one who understands why the fires should be kept out. Such a system cannot be applied economicarry to small scattered tracts, and under the provisions of the state forest reserve law only small and widely scattered tracts are apt to be turned over to the state for forestry purposes. Here is a fundamental difficulty which is destined to give the state forestry board much trouble.

An efficient fire patrol, under a financially practical system of forest management, is only possible when the area to be protected is sufficiently large and well defined to be economically administered. For the state to acquire title to such tracts would involve an expense and delay which experience would show to be very great. Yet it must be repeated that reasonably large areas are necessary if any rational work in reforesting of a permanent character is to be done, because of the fundamental importance of protecting the young growth from fires cheaply.

And now to return to the reservations. In the proper disposition of these lands lies the key to Minnesota's great opportunity. The magnitude and diversity of the interests involved, greed and the lack of clear understanding of the question in its true bearings have caused much fruitless discussion. The question as to what lands can properly be classed as agricultural will never be settled to the satisfaction of all. Time and experience, sometimes bitter, will decide. But it is safe to say that the hardwood lands will make permanent agricultural soil, and that Norway pine ridges will not prove of any lasting fertility. Of the 611,592 acres of land surface within these reserves 125,000 acres approximately is now owned by the Indians in personal allotments. 100,000 acres approximately is under the terms of the law classified as pine lands. As such lands must have but 10,000 feet per 40 acres of standing pine, it follows that nearly all the pine must be embraced within these 100,000 acres. This leaves approximately 385,000 of land which is either hardwood, brush land or swamp. This may in reason be supposed to contain the bulk of the land within the reservation which is fit for agriculture.

In fairness to all interests the situation seems to demand:

1. The preservation intact of the pine on the fractions of 40's bordering the shores of the large lakes or wherever the aesthetic value of the pine is so great as to fairly offset its commercial value, when the interests of the whole community are considered.

2. The opening of the reservation to settlement.

3. The exclusion from settlement of the 100,000 acres known

at present as pine lands and the preservation of the title to this land in the hands of the government.

On these three points all who wish to be fair should agree. So little attention has been focused on the question of retaining the title to these pine lands, apart from the disposition of the pine thereon, that its great significance has never been realized. Here the state is legislating with a view to slowly and painfully acquiring title to scattered tracts of devastated land, and at the same time will allow to slip through her fingers the chance to secure for forestry within her borders a tract ideal in size and location. This tract would be under the control of the government. Those who imagine that this would not be an advantage should remember that the state is not prepared to manage forest lands. She has neither the experience nor the first outlines of a working policy, while the forestry bureau has both. The recent tremendous growth of the bureau of forestry, and the practical nature of the plans of forest management which have been prepared for and adopted by many lumbermen for private holdings, make it certain that any plan prepared by them for this tract would conform to practical lines. The government could and would patrol for fires, and thus the most vital point would be at once secured.

The improvement of this opportunity for our state lies in the hands of seven men, our national legislators. Let us hope they will not stop short of placing the control of the cutting of this pine in the hands of the forestry experts of the government. But in any case it must be clearly recognized that once the title to the fraction of the reservation known as pine lands passes into private hands, all hope of regenerating the forest is lost, and Minnesota will some day realize with sorrow her ignorant shortsightedness.

Mr. Frank Yahnke: "The good seed has been planted, and I hope we will keep on until we spread it all over the country, until every home has plenty of fruit, and in the home where there is fruit grown there will be happy children and healthy children. I know a little something about it myself, and I know something about Mr. Lord; I know he has grown good fruit and he has grown good children. One of his sons has got one of the biggest architectural contracts in the country. Let us all be fruit growers, and we will be honest in our old age. When a man becomes old, if he has been a fruit grower, he will be honorable. Let us all be honorable in our lives and in our characters, industrious and helpful, shining lights by right living, beautifying the lives of our fellow men, and the whole country will rise up and call us blessed, and all will share the benefits of our efforts." (Applause.)

PICKING AND PACKING SMALL FRUITS FOR MARKET.

C. E. OLDER, LUVERNE.

In the picking and packing of small fruits for market it is necessary that great care be exercised in handling and sorting so it may make a good and creditable appearance when it reaches the retailer's tables. New, clean packages are imperative, and they should also be of a size to most readily accommodate those who have the handling of them. They should be as even in appearance as possible in the same package. If part of the berries are small, put all of the small ones together and the larger ones by themselves, as a nice even lot of small berries if they are neat makes a better appearance than a mixed lot of any kind.

The quart boxes in crates that are usually used for strawberries seem to be about the right thing for them. They are also very good for currants and gooseberries, but they are a failure for raspberries, and the pint boxes are not very much better, as in one warm night they will mould and spoil. I think a square shallow box, so constructed that the boxes when filled have about two or three layers, holding a pint or quart, would carry raspberries safely double the time that they will keep when put in deep boxes, as they generally are at present. I have tried this plan on a small scale, and I would suggest that our fruit growers give this idea a little thought and a fair trial. In picking berries of any kind do not touch them when the vines are wet; they will look "mussy" the best you can do. Raspberries and gooseberries are not so bad as other kinds, however, but I do not like to disturb them when they are very wet.

In gathering plums we pick the largest and some of the thickest, to thin out, just as soon as they nicely begin to ripen, and this thinning out gives the balance a chance, and they grow almost as large as the first lot, and we think we get a better yield by so doing. Now when gathering plums, what do you put them in? Usually in our part of the state we use baskets, holding one bushel or one and one-half bushels. With this amount in one basket do you not readily see that if the plums are ripe or nearly so the weight of this mass will crush and destroy a good share of the fruit in the bottom of the basket? Can we not have a crate containing eight boxes or baskets of one-half peck each, making one bushel of plums in a crate and selling at retail for about thirty-five cents per box, something on the plan that the California plums are put up. I believe that the better prices, as well as the better satisfaction to ourselves, would more than compensate for the added cost of the baskets and crates.

The time is not far from us when this matter of packages for plum shipping will have to be considered. Hundreds and, I might say, thousands of new plum orchards in this state are just coming into bearing, and some way more practical than the haphazard methods now used is certainly necessary.

Mr. W. B. Mason: I would like to ask the gentleman whether he would make his cases so they would hold an even half bushel of plums?

Mr. Older: We have used the bushel basket ourselves.

Mr. Mason: I have been making cases that hold a half bushel of plums for five years, and they are very successful.

Mr. Older: With California plums a small package is generally found to be better.

Mr. H. L. Crane: I ship my plums in sixteen quart crates and large baskets. At certain times during the season I do better with crates, and at other times baskets take better. I have customers that object to both kinds. So far as shipping in bushel baskets is concerned I do not think that measure is a good thing to use, although I have made use of it. It bruises the fruit more or less, and it becomes juicy before it is sold. So I am not satisfied with any measure I have used, although what I have used is the best I could get. I have used the large grape basket to some extent, and it makes a very handy package, but the buyer objects because he does not know how much the basket holds and what quantity he is paying for. If there were no objection to the grape basket on the part of the buyers it would certainly be a very handy package in which to handle plums. It looks neat and tidy. I think if everybody would adopt that sort of a package it would be the best way of selling plums. Now they are shipped in boxes, two bushel sacks, sixteen quart crates, all kinds of baskets, and none of the packages are satisfactory. If there were some standard way of bringing plums to market it would be much better.

Mr. O. M. Lord: I have been very fortunate this year in selling my plums at home. I sold very few in the general market. I prefer to ship them in one-third bushel baskets covered with netting. They are picked into the same baskets, and our pickers are generally little girls. I do not like to pour them from one basket into another if it is possible to do otherwise. Commission men like them best in that form. I have tried to get them to take smaller baskets, but without effect. The commission men then put them up in smaller baskets.

Mr. Wright: Does not the express come a little higher when the baskets are covered with netting?

Mr. Lord: I don't know that there is much difference in the express charges. The express charges are made by the hundred, and it does not matter much how they are packed or what the package is. I send them by express almost invariably.

Mr. Wright: I find that out our way the express rates are higher when the baskets are covered with netting, because they cannot be piled up.

The President: I think this demand for plums in quantity comes from the idea uppermost in the minds of the people that buy them, which is to keep the best plums that we are growing, and which we are trying to make the equal of any plums grown anywhere, down to the level of the old wild plum and thus fight against what we are trying to do. They do not stop to ask how much there is in a 25 cent basket, and I think after a while it will make no difference.

Mr. C. H. True (Iowa): We like the sixteen quart crates the best. I find customers will pay a dollar for a sixteen quart crate sooner than they will pay for a basket holding the same amount. A dollar for a market basketful of plums seems high compared with a sixteen quart crate. They show up very nicely and handle conveniently in those sixteen quart crates. We sell them in those sixteen quart crates at from two to two and one-half dollars a bushel. Of course, the plum market with us this past season has been better on account of the scarcity of apples.

Mr. Lord: I have shipped a good many plums in those crates, and where you ship to a commission house and depend upon them to distribute you find a better market. Shipping in crates it costs a good deal more. I get my baskets for three and three-fourths cents apiece, while crates cost one cent a box and eight cents per crate; so it makes a considerable difference in the cost of the package.

Mr. Bush: This society ought to take hold with other states and try to secure uniformity in the size of package for plums. We can grow them all over this state and grow them of excellent quality. If we could have a uniform package in which to market our plums they would bring us a good deal more money. We have handled our plums in much the same way as Mr. Lord has done, using half bushel drop handle baskets, but when we began to ship them we had to pay extra express.

Mr. O. W. Moore: I agree with Mr. Bush in what he says about a uniform package for plums. I think this society should take some measures to adopt a uniform package for the state of Minnesota for small shipments, not over half or one-third bushel. Have it understood that that is the plum package of the state. I think our plums could be handled to much better advantage under such an arrangement than they are now.

Mr. Older: I have seen nice Minnesota plums sold for 75 cents per bushel. The grocer pays the farmers 75 cents a bushel for plums, no matter what they are.

Mr. Oliver Gibbs: Any one who takes notice of the manner in which our fruit is sold in grocery stores in our small towns, and then goes to a large market and sees how it is handled and disposed of, must be impressed with the fact that it is time for the horticultural society of this state to take this matter up. Transcendent crab apples have been selling for 25 cents a bushel and a slow sale at that, when with very little labor they would bring $2.00 a bushel. There is no labor we can do on the farm that will pay so well as to put it into the marketing of our fruits. It will pay to handle anything well that we have to sell, but this is more particu-

larly true in the handling and selling of fruit. I found while on my Dakota farm I could take to market the same plums that my neighbors were hawking about at one dollar per bushel and get two dollars per bushel for mine. The trouble is our farmers do not know that there is any other price or a better way. With a membership of more than one thousand this society certainly ought to be able to create a sentiment among our growers. I want to relate a little incident by way of illustration. A number of years ago when I lived at Lake City, when no one knew there was any value in crab apples, I happened to be in Chicago one day and I saw a package of miserable looking crab apples in one of the largest grocery stores in the city. I looked up the proprietor and said to him, "What will you give for Transcendents by the bushel if they are picked and handled like eggs and delivered to you in good condition?" Said he, "How many have you got?" I said, "Perhaps I could ship you forty or fifty bushels." The very best apples were then selling on Water street at $1.50 to $1.75 per barrel. He said, "I will give you $1.35 per bushel for crabs handled as you state, f. o. b. at your place." I went home and bought an orchard for just $5.00, and my wife marketed over one hundred bushels at $1.35 per bushel, and when those were gone I went around and bought them at fifty cents per bushel, and when I got through I had shipped him 140 bushels at $1.35 per bushel, and that was all because they were put up and marketed in good shape. This suggestion of agreeing with other societies as to a uniform package is a good one. There is money in all of these things, and our people don't know it.

Mr. Wedge: I think we are all interested in marketing our fruit in the most profitable way, especially as the plum is coming to be more and more grown and appreciated by the people, and we ought to get them to the consumer in the most appreciable form.

The President: "In regard to the quantity of apples grown I think Mr. Loring has the figures very much below the record. Last year we raised over a million bushels. It is something like the case of the woman on the cars going out west. On one side of the car was sitting a woman of uncertain age who had never been married, and in the seat across the aisle sat one who had been married, and this last one had a little box in the rack overhead which she would take down every little while and hold in her lap, then set it on the seat beside her, and then she would put it back in the rack, and her actions showed that she was evidently very solicitous about that little box. The old maid had been watching her and finally could stand it no longer. She said, 'I am not the least bit curious, only I would like to know what you have in that little box that you are so anxious about.' 'Oh,' said she, 'alas, that little box contains the ashes of my four husbands.' 'Four husbands, mercy on me!' said the old maid, 'here I have been forty years hunting for one husband and cannot find him, and here you are with husbands to burn.' (Great laughter and applause.) It is only going to be a few years before we are going to have apples to burn here."

SUMMER MEETING, 1902, MINNESOTA STATE HORTICULTURAL SOCIETY.

MISS EMMA V. WHITE, MINNEAPOLIS.

(Official.)

As has been the case for a number of years past, the summer meeting of the society was held at the State Farm School, St. Anthony Park. The time for holding this meeting is determined by the date of ripening of the strawberry crop, such a date being selected as to make it possible to exhibit this fruit at its best. An examination of these dates would serve as a good index for the forwardness of the season, and yet they do not vary more than a week at the farthest. This year the meeting was held on June 19, a date somewhat earlier than usual. As the date set for the Minneapolis Grocers' picnic has come to be a symbol of expected rain, so that of the summer meeting of the horticulturists is a sign of perfect weather, and so this year we could say, "What is so rare as a day in June!", for the day was indeed perfect. This has come to be a very popular gathering, a large number of the members of the society and their friends from the Twin Cities and the near vicinity being in evidence, and this year there was an unusually large delegation present from other parts of the state. From outside the state we had the pleasure of meeting Mr. Oliver Gibbs of Prescott, Wis., Prof. C. B. Waldron, horticulturist at the North Dakota Experiment Station, Fargo, N. D., and ex-Secretary A. J. Philips and wife, West Salem, Wis.

The morning was spent in arranging the fruit and floral exhibits, in social intercourse and in visiting various points of interest about the grounds. Dean W. M. Liggett and Prof. S. B. Green acted as hosts for the school, assisted by the other professors connected with the institution, all of whom were ready to show and explain whatever pertained to their departments. Several new buildings were going up, and there were everywhere signs of progress and development. It is well worth a visit to see and learn something of our agricultural school, and we are not surprised to learn that this school ranks among the first in the United States in attendance and in its appointments.

No small feature of the day is the noon lunch, to which all visitors contribute, but which would be much less enjoyable without the complement of coffee, lemonade, delicious strawberries and the service which the hosts so generously furnish.

President Pendergast called the meeting to order for the program at 2:25 p. m., and after a few words of greeting introduced the speakers of the afternoon. There were four topics on strawberries, followed by an especially valuable paper by Mr. J. M. Un-

derwood on the culture of roses. This with the other papers read at the meeting, viz.: "Growing Pedigree Strawberries," by B. T. Hoyt; "Ups and Downs of Strawberry Culture in Minnesota," by Wm. Lyons, and "The Position of an Economic Entomologist," by Prof. F. L. Washburn, will appear in early numbers of our magazine.

Mr. O. C. Gregg gave a practical talk on "Strawberry Growing on the Prairie." He prefaced his remarks by a complimentary reference to the State Horticultural Society, ascribing to it his interest in fruit growing, and his "God bless the Horticultural Society of Minnesota" was heartily appreciated.

In his talk on "Growing Strawberries on the Prairie," he brought out the following points, speaking first of the increasing popularity and value of the Russian golden willow as a shelter belt. He would set the strawberry bed in the spring, after the earlier spring work is out of the way, in rows six feet apart and one and one-half feet between the plants, to allow cultivating with the horse plow, and he had found it possible to keep the bed entirely free from weeds. The importance of having vigorous plants to start with was emphasized. He plants Bederwood and Warfield and has a bed from which all fruit buds are picked and no fruit allowed to grow in order to get the most vigorous plants for setting. In the late fall, when other work is not pressing, the bed is very heavily mulched with straw, which is allowed to remain on late in the spring, thus holding the bed back to avoid June frosts. When the straw is removed it is kept and used to mulch the golden willows. Ashes are used as a fertilizer. Vigorous plants and thorough cultivating, making an absolutely clean bed, and heavy mulching, were the points emphasized in Mr. Gregg's talk.

Prof. Green spoke on "Strawberries at the Station," prefacing his remarks by referring to Superintendent Gregg's preference for spring planting of strawberries. Prof. Green said that autumn was also a good time when there were plenty of runners and the conditions were right. Last fall we had moist, cool weather for a long time in August, but when it is as dry as it often is at that season, it will not do at all to plant in the fall. Speaking of the station he said in part: "We concentrate our work here in certain lines. We can't hope to compete with a man like Elliot who gets up at four o'clock in the morning. Besides, we haven't the soil. At Lake Minnetonka they have a loess loam, the best soil in the world for strawberries and other fruit. They have the same thing up in Manitoba. I saw a magnificent display of apples at

Winnipeg. We are not trying to do very much with strawberries here now on account of the soil; but we are growing some thirty-five or forty varieties and mean to keep pretty well posted. We are, however, paying some attention to originating new varieties. When I was in France I saw some very nice berries on the Grounds of Vilmorin, which they called St. Anthony de Padua. I brought some seed home with me, but the plants grown from it did not do well. However, I wintered them in the greenhouse, and the next season crossed them with the Bederwood and the Crescent, and I now have more than a thousand seedlings, and we hope to get from them some new varieties of merit. That is the kind of work I am trying to do now, and that is the kind of work I think we ought to do here, where it is possible for us to control the conditions in a way that the ordinary grower cannot do. We are doing the same thing with the Compass cherry and sand cherry.

Mr. Underwood's paper on "Rose Culture" was prepared at the special request of the secretary, on account of the dearth of material in our reports pertaining to the subject and his special fitness for its preparation. As he spoke Mr. Underwood stood in front of the beautiful display of thirty-five varieties of roses made by the Jewell Nursery Company, which was a powerful and beautiful illustration and object lesson for the enforcement of the value of the methods of culture described.

At the close of the program a vote of thanks was given to those who had contributed papers and talks, Mr. Underwood's paper on roses receiving especial mention, with the hope that it might be published generally in the press of the state. A hearty vote of thanks was also given to the farm school management for their oft repeated and most generous hospitality. The secretary also came in for a share of the public thanks, for his interest and energy in bringing the society to its present large membership. Mr. Elliot in making this motion stated the membership roll lacked only fourteen of being an even 1,200, and gave an invitation to those present not members to hand in their names, and enough responded to bring the list up to the coveted number.

A pleasant feature of the proceedings was the voting to place on the honorary life membership roll the names of Mr. Wm. Lyons, for twenty years an active and efficient member of the society; Mr. A. J. Philips, of West Salem, Wis., who has long taken an unusual interest in this society of a sister state and rendered it good service by voice and pen, and the honored president of the society, Prof. W. W. Pendergast, a horticulturist by nature, though a ped-

agogist by profession. Each responded to the call of the society in an expression of thanks, Mr. Lyons supplementing his response by relating a most successful experience in fall planting of a lot of Clyde strawberries. Mr. Pendergast said he had never felt more at home anywhere than since he had been an active member of the society, and he thanked the society and the members of the executive board who had thus taken advantage of his absence from their meeting the previous evening. Mr. Philips responded more at length, telling a number of stories in his usual happy vein.

The exhibit this year was an unusual one, both in the number of entries and also in the quality of the articles shown. One hundred and ninety-five entries in all were made, which is about a half more than the usual number, and considerably more than ever have been made before at any of our summer meetings. Fifty-nine varieties of strawberries were shown, and they were noticeable for their uniform large size and fine condition. There were forty-eight varieties of roses on exhibition, most of them, as has been noted, from the grounds of the Jewell Nursery Company. A few entries in other flowers and in vegetables, and a number of entries of mushrooms made up the total of the best exhibition ever made at a summer meeting of this society. The list of premiums awarded, which follows, will serve as a key in opening up the details of this exhibit.

AWARD OF PREMIUMS, SUMMER MEETING, 1902.

STRAWBERRIES.

Article.	Exhibitor.	Premium.	Amount.
Countess	H. H. Pond, Bloomington	First	$0.75
Clyde	G. W. Strand, Taylors Falls	First	.75
Bubach	" " "	First	.75
Bederwood	A. Brackett, Excelsior	First	.75
Parker Earle	" "	First	.75
Bederwood	H. F. Bussee, Minneapolis	Second	.50
Crescent	" "	Second	.50
Lyon	H. W. Shuman, Excelsior	First	.75
Johnson's Early	" "	First	.75
Nic Ohmer	" "	First	.75
Excelsior	" "	First	.75
Livingston	" "	First	.75
Brunette	" "	First	.75
Aroma	" "	First	.75
Arnot	" "	First	.75
Senator Dunlap	" "	Second	.50
Pocahontas	" "	First	.75
Annie Kennedy	R. A. Wright Eureka	First	.75
Corsican	" "	First	.75
Sample	" "	Second	.50
Splendid	S. R. Spates, Markville	Second	.50
Sample	" "	Third	.25
Brandywine	R. J. Kelley	Second	.50
Walker	S. R. Spates, Markville	First	.75
McKinley	" "	First	.75
Senator Dunlap	" "	First	.75
Lovett	" "	Second	.50
Lovett	Thos. Redpath, Wayzata	Third	.25
Splendid	" "	Third	.25
Robinson	W. L. Parker	First	.75
Bederwood	Clinton Nursery Co., Owatonna	Third	.25

Article.	Exhibitor.	Premium.	Amount.
Enhance	Wm. Lyons, Minneapolis	Third	.25
Aroma	" "	Third	.25
Bubach	" "	Third	.25
Jerry Rusk	" "	First	.75
Maxville	" "	First	.75
Monitor	" "	First	.75
Pokeonoka	" "	First	.75
Saunders	" "	First	.75
Woolverton	" "	First	.75
Brandywine	B. T. Hoyt, St. Paul	First	.75
Warfield	" "	Third	.25
Crescent	" "	First	.75
Carrie	" "	First	.75
Cyclone	" "	Second	.50
Warfield	E. A. Farmer	Second	.50
Warfield	A. P. Young	First	.75
Haverland	"	First	.75
Sample	"	First	.75
Splendid	"	First	.75
Brandywine	Wm. H. Brimhall, Merriam Park	Third	.25
Lovett	A. O. Hawkins, Excelsior	First	.75
Clyde	" "	Third	.25
Wm. Belt	" "	First	.75
Glen Mary	" "	Second	.50
Enhance	" "	First	.75
Haverland	" "	Third	.25
Bride	F. F. Farrar, White Bear	First	.75
Eclipse	" "	First	.75
Glen Mary	" "	First	.75
Up-to-date	" "	First	.75
Klondyke	" "	First	.75
Beverly	" "	First	.75
Margaret	" "	First	.75
Seaford	" "	First	.75
Isabella	" "	First	.75
Aroma	" "	Second	.50
Clyde	" "	Second	.50
Crescent	" "	Third	.25
Enhance	" "	Second	.50
Maximus	" "	First	.75
McDowell	" "	First	.75
Beauty	" "	First	.75
Haverland	" "	Second	.50
Tennessee	" "	First	.75
Bubach	" "	Second	.50
Saunders	" "	Second	.50
Jerry Rusk	" "	First	.75

W. L. PARKER, J. P. ANDREWS } Judges.

CUT FLOWERS.

Paeonies	T. Redpath, Wayzata	First	.75
Paeonies	S. R. Spates, Markville	Second	.50
Bouquet of Flowers	Thos. Redpath, Wayzata	Second	1.00
Bouquet of Flowers	W. L. Parker, Farmington	First	1.50
Paeonies	" "	First	.75
Paeonies	" "	Second	.50

OLIVER GIBBS, Judge.

CUT ROSES.

Provence	J. R. Cummins, Eden Prairie	First	.75
Paul Neyron	" "	First	.75
Mary Washington	" "	First	.75
Multiflora	Jewell Nursery Co., Lake City	First	.75
Baltimore Belle	" "	First	.75
Crimson Moss	" "	First	.75
Seven Sisters	" "	First	.75
Gem of the Prairie	" "	First	.75
Princess Adelaide	" "	First	.75
Paul Neyron	" "	First	.75
Gen. Jacqueminot	" "	First	.75
Camille de Rohan	" "	First	.75
Baroness Rothschild	" "	First	.75
Countess of Oxford	" "	First	.75
Alfred Colomb	" "	First	.75
Julius Megoten	" "	First	.75
Marshall P. Wilder	" "	First	.75
John Laing	" "	First	.75
Victor Verdier	" "	First	.75
Gracilis Moss	" "	First	.75
Countess Murianes	" "	First	.75
Clio	" "	First	.75

Article.	Exhibitor.	Premium.	Amount.
Brenda	Jewell Nursery Co., Lake City	First	.75
Salet Moss	" "	First	.75
Flora McIvor	" "	First	.75
Crested Moss	" "	First	.75
Francois Levet	" "	First	.75
Fisher Holmes	" "	First	.75
Mabel Morrison	" "	First	.75
Madm. Gabriel Luizet	" "	First	.75
Magna Charta	" "	First	.75
Anne de Diesbach	" "	First	.75
La France	" "	First	.75
Ulrich Brunner	" "	First	.75
Victor Verdier	" "	First	.75
Madam Plantier	" "	Second	.50
Crimson Rambler	" "	First	.75
Queen of Prairie	" "	First	.75
Harrison Yellow	S. R. Spates, Markville	First	.75
Blush	" "	First	.75
Seven Sisters	Thos. Redpath, Wayzata	First	.75
Gracilis Moss	" "	First	.75
Pink Beauty	W. L. Parker, Farmington	First	.75
Rose Rugosa	" "	First	.75
Madam Plantier	" "	First	.75
Seven Sisters	" "	Second	.50
Queen of the Prairie	" "	First	.75
Madm. Wood	" "	First	.75
Basket	" "	First	.75
Lady Washington	" "	First	.75

OLIVER GIBBS, Judge.

VEGETABLES.

Pie Plant	Mrs. F. H. Gibbs, St. Anthony Park	Second	.50
Cucumber	" "	First	1.00
Asparagus	S. R. Spates, Markville	First	1.00
Asparagus	Wm. Lyons, Minneapolis	Second	.50
Peas in pod	" "	First	1.00
Pie Plant	" "	Third	.25
Potatoes	" "	First	1.00
Pie Plant	H. F. Bussee, Minneapolis	First	1.00

A. BRACKETT, Judge.

ORCHARD PLANTING IN MINNESOTA IN 1902.—An extraordinary amount of nursery stock has been planted in Minnesota this season, and probably nothing approaching the amount has ever been distributed in our state in any one season before. Quite a number of orchards of a thousand or more trees have been set out to the personal knowledge of the writer, and undoubtedly there are many more of which he has not heard. With fifty nurseries in the state, most of them employing agents, from one to 200 each, the opportunity for purchasing nursery stock has not been lacking. The success of the past few years has stimulated and is stimulating planting to a great extent. Outside nurserymen have contributed liberally to this result. One pleasant feature of this year's business is the large proportion of ornamental stock being planted, which indicates an advance on the part of our people, not only in the ability to purchase, but in an increasing interest in this equally important branch of horticulture, which contributes so much to the development of our higher nature. A word of advice at this time when orchard planting is so rapidly extending would be to plant very sparingly of new varieties and stick to the kinds that experience in your locality, or the advice of reliable planters, indicates to be successful. Let the other fellows do more and you do less experimenting. Each planter should do some experimentation, but if restricted the losses will be less and encouragement to further experimentation will be greater.—SECY.

THE PRESENT MEMBERSHIP.—The spurt made at the summer meeting to bring the membership for this year up to 1,200 resulted in a decided success, and with other names that have come in since has given us up to August 1st a total of 1,203 members, which will do until we still further increase it.—SECY.

Secretary's Corner.

MIDSUMMER TRIAL STATION REPORTS.—The semi-annual reports of the trial stations have been deferred this year and will appear in the August number, instead of, as heretofore, in the July issue. We hope that this postponement will add to the value of the reports, as the superintendents can note at a later date more fully the effects of the previous winter, both on the plant and on the crop.

THE PROBABLE ORCHARD CROP IN MINNESOTA.—Returns from many points in the state where apples are grown with success indicate, at the time of going to press, the prospect of a good apple crop. Those trees which bore last year are only fruiting in limited quantities, as was to be expected, but other trees, which include the larger portion of the bearing trees of the state, are well set and with a present prospect of retaining the crop to maturity. The plum crop promises to be very light. The small fruit crop is generally excellent.

LADYBIRDS VS. SAN JOSE SCALE.—The efforts of the U. S. Department of Agriculture last year to import from China the ladybird, which is said to be a parasite of the dreaded scale, has resulted in saving fifty-two out of the whole importation. These may be said to have cost $2,000 each. These have laid many eggs, which have hatched, and the larvae are already feeding on the scale insects provided for them. Is this to be the final settlement of this pest?

AUTUMN SOWING OF PINE SEEDS.—For many years we have raised evergreen seedlings, but have made a almost uniform practice of sowing them all in the spring with the exception of red cedar, which we always prefer to sow in the autumn. Last year, however, I was persuaded by a friend to try the sowing of bull pine seed in autumn. Our land here is packed so hard in winter that it is not well adapted for fall sown seeds, as such a crust forms that frequently the seedlings cannot get through it. To obviate this difficulty I mixed a large amount of sand in the surface soil of the bed and, after sowing the seeds broadcast and covering them about one-half an inch deep with sand and soil, put on fully an inch of clear sand, and, as a result of this, I have this spring a beautiful lot of pine seedlings, which are a surprise and a delight.

SAMUEL B. GREEN.

FRUIT AT SLEEPY EYE.—Plum and apple trees came through winter in good condition. Prospects are for a good crop of plums. I have a number of new varieties bearing for the first time; namely, Mankato, Milton, Wittman's No. 1 and 2, Golden Queen, Brittlewood, Hammer, etc. Apple trees are in bloom and are looking fine. I have some Lyman's Prolifiic two year planted in bloom; University two year planted are in bloom. Juneberries are loaded with fruit this year. All raspberries froze back two-thirds where not covered. Gregg is the best in black and Loudon best in red. Strawberries are promising. I have some cherry trees from Denmark; they are all white with blossom. The cherry is not very large and rather sour. Orel No. 20 is in bloom; it is from Russia. Besarabian planted eight years ago is not fruitful. The tree is large and looks healthy, but has never borne any yet. Peerless apple trees planted six years ago are blooming finely. The trees are hardy on the open prairie.

May 19, 1902. MARTIN PENNING.

FRUIT PROSPECTS IN THE RED RIVER VALLEY.—The writer spent the ten days immediately following the summer meeting with the Institute Corps in the Red River Valley, visiting points easily accessible from Crookston. The observations indicate a very hopeful outlook for the successful culture of fruits, including the apple, both standard and crab, in that region, and the favorable conclusions arrived at are an unexpected result of the visit. In a later number of the magazine these observations will be given somewhat in detail, illustrated with a few photographs.

DEATH OF PROF. E. S. GOFF.—The death of Prof. Goff, whose obituary occurs as the opening article in this number, occurred quite unexpectedly to those who were not intimately acquainted with his condition, it being, as we understand, the result of an operation which he did not very long survive. Our readers will note that in the last issue of the Horticulturist, in the Secretary's Corner, reference was made to a book on "Commercial Fruit Growing" which Prof. Goff has lately issued. This work being especially fitted for this locality, and being completed so near the time of his death, will stand as a monument to his memory, though none is needed with those who were so fortunate as to be acquainted with him. Men of his training and zeal and fitness for the place he has so successfully filled are not easy to find, and it may be long before his place in the Wisconsin State Experiment Station is filled with equal adaptability. Minnesota with Wisconsin mourns the loss of this most excellent and useful man.

A HORTICULTURAL FAIR AT WINNIPEG.—Our sister society in Manitoba, the Western Horticultural Society, announces a horticultural fair to be held in Winnipeg, Aug. 28, 29, 30, and, as we understand it, not having connection with any other similar enterprise. Premiums to the amount of $1,000 in money are offered, limited to the products of Manitoba and the Northwest territories. The larger portion of this goes to vegetables, but premiums are offered for a good assortment of apples, plums and small fruits, considering the newness of the pomology of that country. Members of the society make entries free. Non-members are charged twenty-five cents each for entries up to four entries, but after that they are free. The purpose evidently is to make every exhibitor become a member of their society. The scale on which this enterprise is being conducted emphasizes very strongly the ambitious and successful outlook of their organization. We hope to secure some views taken at the fair for the benefit of our readers.

SELECTING FRUIT FOR THE STATE FAIR.—Be sure and take advantage of every opportunity of selecting fruit for exhibition at the coming state fair. Have this in mind and note the position of any unusually fine specimens on the tree, so that when the time comes to gather fruit for the fair you may know where to find them. A successful exhibit at the fair depends on the same conditions as elsewhere, foresight and careful preparation. With the good apple crop in sight the state fair should make a finer show of apples than has ever been made, and the premiums on collections being divided pro rata every exhibitor, within certain limits defined in the premium list, will be sure of a share. As to plums, the crop being so light we urge you to save as many varieties as possible and send or bring to the fair. There has always been a good plum exhibit, and the management are very desirous that it should be repeated this year. Will you not aid us by making a special effort in this direction? Have you received a premium list?

7. Prof. C. B. Waldron, Fargo, N. D. 8. Thos. Tunis Smith, St. Paul. 9. Sec'y A. W. Latham. 10. Prof. Thos. Shaw, St. Anthony Park. 11. O. M. Lord, Minnesota City. 12. Ex-Sec'y A.J.Philips, West Salem, Wis

1. Chas. M. Loring, Minneapolis. 2. J. R. Cummins, Eden Prairie. 3. J. M. Underwood, Lake City. 4. Pres. W. W. Pendergast. 5. Supt. O. C. Gregg. 6. H. H. Heins, Lydia.

SOME HORTICULTURISTS PRESENT AT THE LATE SUMMER MEETING OF THE MINNESOTA STATE HORTICULTURAL SOCIETY.

THE MINNESOTA
HORTICULTURIST.

VOL. 30. AUGUST, 1902. No. 8.

A COURSE IN FORESTRY IN THE STATE UNIVERSITY OF MINNESOTA.

PROF. SAMUEL B. GREEN, MINNESOTA SCHOOL OF AGRICULTURE.

The University of Minnesota was one of the first educational institutions in this country to offer instruction in forestry. This was begun twelve years ago, in a small way, in the school of agriculture. It has now developed into a strong course in the school of agriculture, and several terms' work are offered in the college of agriculture. Within the last four years there have been established two special schools of forestry in connection with the great universities of this country, and several smaller schools and numerous courses in forestry have offered instruction along similar lines. I have thought, perhaps, that I might be charged with lack of enterprise in not urging the establishment of a forestry school in the University of Minnesota, but it has seemed to me that it was better not to crowd such a course too fast, and I have thought that if there was a real demand for it, it would make itself felt, so that the school would come as a natural outcome of the demand. Within the last two years there has been a great increase in the general interest manifested in the whole country in the subject of forestry, and I have had numerous inquiries from various sections as to the opportunities offered for getting a knowledge of forestry in our university. And this year, even after advising a number of applicants to preferably go to regular forestry schools, there remained two graduates of other colleges and other students who wished to come here and take special work in forestry. It seems to me that this growing demand ought to be met, and a short time ago I had a talk on the subject with President Northrop. He agreed with me that it was not desirable to make a special school of forestry in the university, but rather to offer a special course on this subject, and while something of this sort is being done this year, yet I expect in the very near future to see the work offered greatly increased, and to make a good, strong course.

Now what should be offered in such a course of study? We should aim to educate those who come to us to occupy the positions of superintendents, and to do this we must give them a good general education. After this a forester should know, first of all, the common practices of the nursery business in the raising of seedlings and their care and management. He should have considerable experience in the woods, and special opportunities for observation. He should have special training in surveying and platting, because he will have much to do with land measurements. He should, of course, understand the estimating of timber, because this is the source of the wealth which he is to handle. A knowledge of accounts is absolutely necessary, as he will have many accounts to keep with the employes that work under him, and in the business which he must conduct.

A knowledge of the botany of trees is very desirable. The laws of physics and mechanics should be well understood, as he must handle heavy loads and deal with all the elements of nature. Geology, too, is desirable, as there is such a close connection between tree growth and soil formations. Zoology, too, is desirable, that he may know the habits of the animals as well as the plants with which he will come in contact, and which affect his forest crop. Chemistry also is desirable, as well as the other sciences mentioned, since he will be away from supplies and be obliged to rely upon his own ingenuity. He should know enough of law to understand land transfers and ordinary legal procedures. He should have some knowledge of economics and the laws of trade, that he may understand the best times and methods of handling his forest product and the forest land in his charge. He should have some idea of agriculture, since agriculture and forestry are almost inseparable for best results; and some of the land under his management will very likely be used for agriculture instead of tree growth. In fact, he must be an all around business man as well as a scientist.

Now, then, in the University of Minnesota we have courses in all these subjects, and our nursery practice can be easily adapted to such a course as this. The general lumbering operations carried on in our woods every year offer the best possible opportunities for observation of the latest methods of harvesting the timber crop. Our course in surveying may easily be adapted to supply what is required here. In fact, all these subjects are at present taught in the university, and in laying out a forestry course it is simply a question of their adaptation so as to bear with more

directness upon the conditions which will present themselves to the forester.

It seems to me that there can be no question but what the near future will see a great development in the care and management of our timber lands, and this will certainly make a demand for superintendents of forest tracts. But in order to be successful they must be well qualified for their work. The opportunities in the sparsely settled districts, where this work will most likely lie, will put the forest superintendent in a position where he will come to the front if a man of natural, average intelligence, and he will become a leader among men. For certain minds such positions are very attractive.

EARLY TOMATOES IN THE OPEN GROUND.

T. T. BACHELLER, MINNEAPOLIS.

If I understand my topic, I am expected to state what I have learned from experience about growing tomatoes in this climate out of doors, and producing mature fruit earlier in the season than the normal or average date of its ripening. My experience in this line is limited, but my success thus far has certainly given sufficient satisfaction to pay for the endeavor.

During the season of 1900 I was marketing limited quantities of very handsome tomatoes in advance of other local outdoor growers, so far as I could learn. The price obtained was such that I wished the quantity were greater. I kept no record of dates, but I know by concurrent events that we were doing considerable picking by the last half of July, and that our first ripe fruit was secured shortly after the Fourth.

In the latter part of January, 1901, we sowed several kinds of seeds in a small window box, simply to test their vitality. The lot included two varieties of tomatoes, Acme and Dwarf Champion. When the plants were well started we decided to try and save the tomatoes until warm weather, and so pulled up the others. When from one to two inches high the young plants were transplanted to fill the entire space, and the number was reduced by pulling out the weaker ones from time to time. Most of the remaining plants made a very robust growth, and when averaging eight or nine inches in height we decided to give them the better accommodations of a hotbed, then just ready for them. Each plant was placed in the center of a quart-sized strawberry box, the boxes were closely packed in order in the frame, and enough dirt put

in to cover them to the depth of fully two inches. When the plants were too high for the frame we placed another 12-inch board on top, and our memorandum shows that by April 29th the foliage was pressing against the glass and the first blossoms were in evidence. The plants had also been allowed considerable fresh air on warm days, to harden them for the next and final change.

The transplanting to the open ground occurred about May 10th, into a sheltered spot on the south side of the barn. Here, again, a number of very slim, delicate plants were rejected, as not showing sufficient vigor to promise satisfactory results. The setting was quite deep, in some cases covering six or eight inches of the stalks. No pruning was done at that time, nor were the plants trained or tied up at any time thereafter, excepting as necessary to keep them off the ground. About sixty-five plants made up the collection, and they had been held back as much as possible in their growth up to this time; but from this time on we did all we could to hasten their development.

Every night for two or three weeks the plants were carefully covered, each one having a gunny sack drawn down over it, supported on stakes. Later in the season, in caring for more than a thousand plants before danger from frost was past,we found other methods of protection, simpler and more effective. Now for results:

I find these entries in my diary:

June 27th—Picked the first ripe tomato.

July 1st Took six pounds of choice tomatoes to the city.

July 11th—Today Yerxa paid me $2.25 for 18 pounds of tomatoes; very smooth and handsome.

Further items of this kind might be taken from my cash book, but I think I have given sufficient proof that early tomatoes can be grown in the open ground if started properly. Comparing this record with the published report of experiments with fifty-six varieties tested in one season at the New Hampshire State Experiment Station, I find reason to call my first products "early." Their record of first pickings is as follows:

From one kind, July 8th; from three varieties, July 16th; one the 18th; ten, the 24th; one, the 27th; seven, the 29th. The first fruits of twenty-three kinds came in July, and of thirty-three varieties from Aug. 1st to 21st. Average date for the entire lot, August 2nd.

In my unprofessional experiment I have established a record which I expect to beat in the future.

The President: Mr. Bacheller has given New Hampshire rather too much credit. Their experiment station has been removed to the extreme southern part of the state. They are on the 43rd and we are on the 45th parallel. I will say in regard to this paper that for the last few years I have driven stakes—ordinary stakes, cut in the woods—fifteen inches apart, and set the tomato plants about the first of June. I tied them to the stakes twice, once about two feet above the ground and once near the top, and in that way it has been much more satisfactory than letting them lie on the ground. I think I would have got a few more tomatoes if I had planted in the usual way and allowed them to spread out more, but it is more handy to gather the tomatoes where they are just about opposite the breast, and they are smoother and better in every way than if they are allowed to run, and they are cleaner and less liable to rot than if sprawling on the ground. I have had ripe tomatoes in June, but only a few—three or four perhaps on one vine—and then they began way back in the beginning, and the rest of the crop is not a particle ahead of those that were started at three inches high in June. So I have given up trying to do anything more than that. I start them at the usual time and set them out about the first of June.

Mr. C. H. True (Iowa): "I do not know when I ever felt so much at home in such a large company of people as I have since coming into your midst this week. I have never been able to visit this society before, I was never in your city until last Monday. I met many old time friends here that I have not seen for years, and when they learned I was to attend this meeting they sent word to me that I should come right to their homes, but I have not visited any of them yet. I have been so interested in these meetings that I have not taken pains to look them up. I presume I will have to remain over until Monday for that purpose alone. I have felt much and enjoyed much and learned much in these few days I have spent with you. I have my note book full from cover to cover. When I go back to Iowa I shall not know where to begin or where to leave off. I shall be glad to be able to report the progress you are making and the good time I have had here with you. I feel very grateful for the many acts of courtesy and kindness that have been shown to me while I have been with you in these meetings. I gained facts and information here that I think I shall carry with me all through life, and this information will be a great help to me in my work."

ADAPTATION OF SCION AND STOCK FOR THE IMPROVEMENT OF FRUIT.

A. J. PHILIPS, WEST SALEM, WIS.

This is a subject which can be discussed in a very few words. Experience and observation, too, have taught me that the main point in adaptation consists in having the stock and scion as nearly equal in size as possible, so that their powers of assimilation are as near alike as may be; by that I mean that their powers to furnish and utilize sap food be nearly the same. This I find makes a stronger growth, heals over much quicker and makes a more perfect and solid union than where stock and scion are not adapted to each other, and I find that the better the adaptation in these respects is, the more marked will be the improvement in the fruit. I can show trees where the grafting was done many years ago in limbs so small that the scion had to be inserted within one inch of the body of the stock. The adaptation was so perfect that the body now has grown over the scion, and it is hard to detect where the grafting was done.

The main point—in fact, I think the only practical point—to be made in improving fruit by grafting, after we consider adaptation, consists in using the most vigorous stock that we can find, as I find many failures caused by using some of the slow growing, weak varieties. I am of the opinion that among the large lot of seedlings in the orchard of the late Peter M. Gideon there will be found some fast growing, vigorous, square-shouldered varieties that will make excellent stocks for top-grafting, even though the fruit may not be desirable. So well am I satisfied of this that on a visit there after his death I found several that I tried to obtain scions of for this very purpose, but his son said he had then no authority to let them go. This is good work for some of the young horticulturists, of which I am happy to see so many in attendance at this meeting. This looks very encouraging for the future success of your society.

Mr. Brand: Where do you get your scions?

Mr. Philips (Wis.): I get them from my own trees. The man that tells the last story generally has the better chance. I had been bragging right along that my grafts had made a bigger growth than those of any other man in the state, eight feet one inch, but Mr. Wilfert came in here yesterday and said he grew one eight feet ten inches. You cannot get that growth unless the scion and the stock are adapted. Our society abused the Walbridge. It is the best apple we have in the state today. It keeps well and the tree is hardy, but we put it out of our hardy list years ago.

Mr. Lord: We understood you once to say it was thrown out on account of quality.

Mr. Philips: Well, I guess it was. Kellogg had prepared a resolution to throw the Walbridge out, and he came to see me on his way to the winter meeting with the resolution in his pocket. I said to my wife, "You make just as good a pie as you can out of the Walbridge." Kellogg likes pie. He took dinner with me, and after he ate a piece of pie he said it was the best pie he ever ate, and he ate another piece. I told him it was made from the Walbridge. He said he didn't believe it. But he believed my wife, and he took out his resolution, and in one place in his report he said that the Walbridge in some particulars was one of the best apples growing. (Laughter.) I graft it on the Virginia because the Virginia has more vigor and strength than the Walbridge. That is the reason the Wealthy does better on the Virginia; the Virginia has more root power.

Mr. Taylor: Where you have grafted on the Virginia and the Martha have you noticed any difference in the amount of fruit?

Mr. Philips: I have not used the Martha much; it crotches. I want something like the Virginia or the Hibernal, with horizontal limbs. Now I have seen some Northwestern Greening trees that had three barrels of apples on, but they crotched so badly that the limbs broke off. I have the Utter bearing on seven different stocks. The Utter bears better on the No. 20 and the Virginia than it does on any other variety with me. I have it on the Duchess. The Virginia is a heavy bearer, and so is the Hibernal, and they are both good stocks.

Mr. Wedge: I would like to ask Mr. Philips whether the fruit he showed at Milwaukee was grown on a top-worked tree.

Mr. Philips: Yes, I top-worked a number of varieties for that purpose. The McMahon I did not top-work to get hardiness; it is hardy enough, but I did it to get nice fruit.

Mr. Wedge: Was the majority top-worked?

Mr. Philips: Yes, the majority of the fruit in our own show was top-worked.

Mr. Wedge: I thought it might be well to state to the society that I happened to be in attendance at the Wisconsin state fair, and there were there some very large displays of apples, but Mr. Philips was way ahead of anything that was shown there in quality; I would not say in number of varieties, but I believe he was ahead there; but it was a large, smooth, handsome display of fruit. I thought if that fact would do anything towards the improvement of fruit it was worth something.

Mr. Jewett: Have you noticed whether it makes any difference whether a scion is grafted low down or far out on the end of the limb as to whether it makes a good union or not. I spoke with Mr. Patten about that matter, and he said the nearer the graft was to the stock the better union it would form. I am going to graft four or five hundred trees next spring, and if there is anything in it I want to make use of it.

Mr. Philips: I vary that according to the size of the limb I graft in. If that limb is very small I cut in pretty close. I get a good union. If it is larger I cut a little further out, sometimes a

foot. I get a spreading top. Go a little further out, and you get a better top and just as good a union as you do close to the tree.

Mr. Jewett: I have noticed in many instances that the top-worked tree makes a better growth than the same variety of tree in the next row does on its own stem. There seems to be something in the stock that gives additional vigor to the growth of the tree.

Mr. Philips: I have been doing this work a great many years, and since I have used the Virginia I do not think there is a tree in the orchard that has outgrown it.

Prof. Hansen: Do you still stick to the Virginia as the best of all?

Mr. Philips: Yes, sir; I do. It is the best of all. I use the Virginia because I think it is the best, and I use the Hibernal because I think it is the next best. I got some very good growth last fall on the Hibernal.

THE FARMER AND HORTICULTURE.

C. H. TRUE, SECY. N. E. IA. HORT. SOCIETY, EDGEWOOD, IA.

The farmer is the nurseryman's best customer. Doubtless the farming communities appropriate ninety per cent of all the products of our nurseries. Seventy-five per cent, at least, of this amount is literally wasted. Take the patronage of the farmers of our land off the list of customers, and our commercial nurseries could not long survive.

For this and other reasons the nurseryman should be especially interested in the farmer's attempts to make a profitable use of the trees and plants that have been placed in his care. When we take into account the immense amount of trees and plants that are annually dealt out to the farmers of our country by the commercial nurseries of the northwest through their agents, and then as we pass over and through our great states and note the absence of orchards of any comparative value, while many farms are totally destitute of what ought to be considered a necessity in the matter of fruit supplies for the family, such conditions not only call forth astonishment but also excite regret and pity in behalf of the planter and his family in the loss sustained and in the disappointment arising out of misdirected effort, as well as from the results of wanton negligence.

The earnest solicitations of an agent for an order, from a farmer customer, wherewith to replenish the losses sustained in a former bill of stock, was met with this reply, "I have spent hundreds of dollars since opening this farm for fruit trees and plants, and right over yonder (pointing to a clump of scraggy, dead and dying trees in one corner of a hog lot) is all that I have left for my money and

my pains, and the pains are not all past yet. Mister, I have made a vow that I will never invest another dollar in nursery stock while I own this place. The fact is, had I saved the money that I have squandered in such investments it would be sufficient to buy all the fruit my family could use during their natural lifetime. I am wholly discouraged along this line."

But the agent is not discouraged for he has so frequently met with this same complaint and has so often found such conditions a fine opening for a deal that he is rather pleased to meet with so little opposition; and after the usual rehearsal retires from the scene, congratulating himself on having secured another forty dollar order.

This has been the farmer's way, and this is only one case among many hundreds of like nature. There seems to be a peculiar fascination associated with the work of tree planting and fruit growing that makes it difficult for one who has once tasted the fruits produced by the labor of his own hands to confess himself defeated in his attempts to supply himself with this pleasing diet, and so he tries again and again.

Past experiences have proven that the ordinary farmer is not a success as a horticulturist. If this were necessarily so, there would be less room for encouragement and hope; but it is not. His misfortunes have not proceeded wholly from his ignorance. To say that the man of agriculture is less intelligent than other men who pursue different avocations would be to cast unjust reflections upon the capabilities of too many here present.

There is one primary cause for his failures to make the business of fruit growing a success, namely, neglect; and not a few honest men when closely questioned have confessed to this fault. This neglect may be attributed to three principal sources, or reasons, namely: lack of time, want of knowledge and lack of interest. The American farmer is a busy man, and it is but natural for him to give the best of his time, thought and energies first to the cultivation of his farm crops and the care of his stock. The little attention devoted to his orchard and fruit lot is given when the soil is too wet to till and at other odd spells. He has been *informed* that fruit trees and plants will not thrive without thorough cultivation and close attention better than will his crops of grain. He does not believe this, however, for his shiftless habit has proven this theory false.

The ordinary farmer does not recognize the products of his orchard as being necessarily a part of the farm crop. And yet the farmer wants fruit; he enjoys it; his family require it; but he is not always willing to give the time necessary to obtain it. From lack of time he fails to study the conditions requisite to the needs

of a paying orchard, as does the practical orchardist. From want of knowledge he is unable to apply the principles governing the habits of trees, their qualities and productiveness. To him a tree is a tree. All trees seem much alike to him. He does not take into account such matter as location, soil, conditions, manuring, pruning and general cultivation. If he has adopted any regular methods likely as otherwise they have been wrong methods, such methods as are illustrated in the practice of one of my neighbors during the past season, who having heard that the pruning of fruit trees would increase fruitfulness, put the theory in practice by beginning with the lowest branches and making a clean sweep of everything as high up as he could reach with an ax, leaving the entire bodies of his trees bare and naked and with no protection whatever to the open wounds caused by the removal of limbs two to three inches in diameter. The very system by which he had thought to bring about a good result has proved a lasting injury and in the end will be the ruination of his little orchard, that had already commenced to bring him fair returns. But he had carried out his idea of pruning. When the inquiry of our farmers shall be, how much labor can I put upon my orchard with profit to myself rather than how can I secure a crop of fruit with the least expenditure of time and effort, then will his success multiply, and his failures decrease proportionately.

The practice of making up losses to the customer either free of cost or at half price we believe has, all things considered, worked to his disadvantage. This plan doubtless was first adopted by some dealer with the view to securing future orders, since it affords the seller an opportunity to call upon the patron an indefinite number of times. Under such a system the careless planter is more liable to neglect the performance of his duty than would be the case if he were left without recourse upon the nurseryman. Not infrequently do disputes arise between buyer and seller in reference to the conditions upon which stock failing to grow should be replaced, and occasionally the law has been called upon to settle the differences. I cannot imagine why the farmer is not under as much obligation to stand one-half of the loss that might accrue from the ravages of cholera among a lot of pigs purchased of him by a neighbor farmer as the nurseryman is to make good the loss of nursery stock during a drouthy summer or frigid winter. From my standpoint of reasoning the nurseryman has done all that reason and justice requires of him when he has placed in the hands of his customer a thrifty and healthy tree or plant, true to name and adapted to its environments, and this is where his responsibility should cease and that of the purchaser begin.

The question, how to supply the farmers of our land with a practical knowledge of horticulture and with instructions suited to their needs, and how to induce them to heed such knowledge and instructions, has been one of frequent mention and consideration at the annual meetings of our different horticultural societies. We believe that much of this information might be furnished direct from the nurseryman to the planter by means of a simple circular containing plain and brief directions for the planting and future care of what has been procured from the nursery, said circular to accompany each bill of goods when delivered. By increasing knowledge, we stimulate interest, and when sufficient knowledge has been gained and interest awakened, more time will be devoted to the work of horticulture among our farmer friends, and less complaints and failures will be the result.

Mr. Lord: I simply want to call attention to one point in the paper in regard to giving instruction in the setting of trees and the care of the ground. I have a relative living on the Detroit river, Michigan, who is a merchant, and he bought a farm on the river and thought he would invest in fruit. He said to me two years ago he did not know what in the world to do with his trees. He could not get a suitable man to take care of them, and he did not know where to apply. I said to him, "Let me give you a little advice. Send to the state university to Prof. Cook to send a student down to trim up and put your trees in order." He wrote me a year afterward that he had taken my advice and had achieved remarkable success. So I want to say to these farmers, send up to the university and get the young men to help you out.

Mr. Yahnke: Yes, or send the farmer to the university.

The President: The speaker was right about one thing, although it was contrary to the general opinion. He said knowledge must grow in order to take an interest in anything. The person who is to take that interest must first know something about that subject, and as he learns a little more he will become more and more interested; and as he is determined at the outset that he will know something about it, and as he begins to learn something about it, he will begin to want to know a little more; and he keeps on increasing and increasing his knowledge as long as he keeps on studying.

Mr. Jno. Freeman: "Although one of our own number I feel I cannot keep still, although I did not say much outside of our scheduled program. I enjoyed this meeting very much, and I felt a year ago that I could not have received more enjoyment from a similar meeting than I did then. But I have received much more instruction and been much more interested in this session than in the one a year ago."

PRUNING AND PLANTING TREES.

A DISCUSSION.

H. V. Poore: What shall we do to get the people interested? They don't care anything about it when they don't get an apple. I do hope we can do something to give them some encouragement. When they get hold of these things then they will do something in return for their neighbors, and then will come the flowers and other things of less practical utility; they will improve and ornament their grounds, and they will look on another side besides that of dollars and cents. It is a great pleasure to eat choice fruits, and it is those that I produce myself that I value the most. But my neighbors have not been as successful; they have been more intent upon producing dollars and cents. We have a large state, we have a beautiful state, we can make large and beautiful exhibits that will attract attention all over the country; we can find them all over the state, but you go to a farmer's house and there is no fruit on the table, but instead he buys his fruit in town. We should try to find out where the mistake has been made in telling the farmers how to do it. I have heard them say not to cut off any branches, but it is just as well to cut the branches all off. If you don't cut off the branches the tree may start well, but the wind will come along and blow it over. When I plant trees I cut off all the branches and make a stick of it, and I have beautiful trees.

Mr. S. D. Richardson: I have lived in Minnesota since 1856, and I have had some experience in tree planting. I used to live in Martin county, and on the farm where I lived there is a large grove. It is just as I said yesterday, one man will say one thing, and another man will contradict it. This man cuts off everything, while I have set out thousands of trees without cutting off a limb, and I have been as successful in tree planting as any man in Minnesota. I have set out thousands of trees. There is a right way and a wrong way of doing things. One man will do one thing and half do it, and another man will do a thing and do it right. When I lived out there in Martin county I bought fifty apple trees, and I hired a man to set them out for me. He wanted me to show him how. I told him anybody could set out trees. He dug a little hole with the spade, and how he managed to dig so small a hole with that spade is a mystery to me yet, but when I found him he had rolled the roots all together and was going to stick the tree into that little hole. I could not tell what the result would have been. That June the grasshoppers broke loose, and they ate everything that came in their way. In the fall I did not have any apple trees to amount to anything.

Mr. O. M. Lord: Mr. Richardson's experience calls to mind some of my own. I received some trees last spring from Mr. Mitchell, of Cresco, Iowa. Most people have a habit of cutting off the limbs of trees when they set them out. I thought I would adopt Mr. Mitchell's plan and not cut the tops back. I set them out with a good deal of care. I had rarely planted a tree without using the knife, and I must say those trees did not give me the satisfaction they did when I cut the tops back severely. I talked with Mr. Patten this morning, and he said he did not believe in that, he believed in trimming them pretty severely. Mr. Howard stood by, and he said it depends upon the season. He said we had a dry season, and if I had cutback the trees severely I would have been all right. He said my trees should have been cut back severely in the tops. That is the plan he adopted. You can pay your money and take your choice. (Applause.)

Prof. Hansen: Just a word on the trimming question. I think we may put the case in this way, that the trimming should not be done all over, the growth in some shape should be left entire so that an outlet may be afforded for the sap. If you cut it all over, there is no outlet for the sap, and it is likely to ferment and cause trouble. If you leave on all of the top, and there are too many limbs, you will have trouble in that case also, and the general practice in this country and in Europe is that you should leave part of the top rather than cut it back all over. I do not know which is the right way or the wrong way; I always trim the roots and then trim the top back half way. I do not believe in severe pruning, and I do not believe in leaving the full top on, only partially so.

Mr. Gibbs: I have had at least fifteen or twenty years of excellent success in planting fruit trees, and I would choose a tree with as good a root system as possible and then break off the big blade of my jack knife.

Mr. C. M. Loring: What is to be done when doctors disagree? I have never had any experience in planting fruit trees, but I have had a great deal of experience in planting shade and ornamental trees. I can give you some experience in that regard that to me has been very valuable, and, I think, to some of my neighbors. In the city of Washington the trees were planted by three of the best arboriculturists in the United States, if not in the world. The venerable William R. Smith planted over one hundred thousand trees, and the loss was less than one-half of one per cent. I planted in this city a row of trees along the street, and my neighbor continued the planting. He would not wait for his trees to grow,

so he planted them with the tops; my trees were cut back and lived, and his died. The next year he did as I did, and every one of those trees are alive. The trees were trimmed to a pole. The Board of Park Commissioners of Minneapolis has planted over ten thousand trees, all of which were "poled." The loss has been less than one per cent. Understand me distinctly, you cannot take up a tree and cut off one-half or three-fourths of the roots and then expect that tree to grow, unless a portion of the top is taken off. I have not had the experience that your president has had in the planting of fruit trees, and all I can say to the gentleman who planted the trees without cutting back, and they all grew, is, that they must have been very small trees. If you go to the woods and pull up small trees you get all the roots, and they will live, but when you take a tree of three or four inches through and do not head them in you cannot make them live in this dry climate. I should regret to have the endorsement of such a method as the gentleman advocates go out from this society. As I have said, perhaps with small trees it may do, as nature strives very hard to keep the trees growing. When you come to take up and replant large trees I do not believe it is possible to leave the tops on and have the trees grow.

Mr. Poore: The average farmer seeks the largest tree he can get for the money, and, as stated, the smaller the tree the larger the proportion of roots you can get. I consider the root of the tree the life of the tree. I do not believe it is possible to take up a tree without cutting off a number of roots. In transplanting the evergreen you have a large percentage of fibrous roots. The life of the tree being in the roots, you must cut the top if you cut the roots.

Mr. S. D. Richardson: The nurserymen do not handle large fruit trees. Trees three to four inches in diameter we have nothing to do with. We handle trees two to four years old, and they are not very large. Nurserymen handle small trees; they do not get enough money for large trees.

Mr. H. C. True (Iowa): There is a vast difference between cutting back and pruning a tree. The greatest difficulty I find in the caring of apple trees is that they almost invariably form too much top. The farmer will ask the question, Shall we cut back the tree? I generally recommend cutting back to a certain extent. Where we cut back the whole top of the tree, it always forms new branches and makes too large a top. I have seen farmers go to work and cut off one-half of the limb of each tree and then, in after years, of course, the branches will increase and spread, and it

will need severe pruning again in order to secure the proper top. If the top is too heavy cut out some of the branches and lessen the number of branches, rather than cut the top off and leave the stock exposed. I think that is much the better way, the more successful way. Many of our farmers do not seem to understand the difference between cutting back a tree and pruning it.

Mr. Frank Yahnke: There is in this matter a good deal of the principle of "pay your money and take your choice." A farmer ought to understand how to plant a tree, how to trim and when to trim. It is not reasonable to suppose that every tree can be trimmed alike. A tree with many branches and the branches close together, ought not to be pruned back, but the branches ought to be cut out, whereas a tree with but a few branches that will stand thickening, ought to be trimmed by shortening in, so as to increase its branching. We ought to take notice of these things and understand the nature of the tree. The main thing is to plant young trees, and young in the top. If a surgeon has to take off a leg, he does not cut an arm off also. Where we have to cut off roots of a tree I do not think it is advisable to cut the limbs off too. The planting of young trees cannot be advocated too much or too strongly. When a tree gets to be three years old it is too old to be transplanted successfully. I think a two-year-old tree is worth fifty per cent more than a three-year-old tree, and seventy-five per cent more than a four-year-old. You lose the greater part of the roots of a three-year-old tree. If that tree is taken up at two years old you can get most of the roots, and if they are well packed and care is taken in shipping, and they are put in the ground in the same condition in which they were dug, there will not be a loss of one per cent. They should be set in the same way that they stood in the nursery. Set the north side on the north side and the south side on the south side in planting. Anybody who has ever planted trees will know that the south side looks redder and the north side greener. The tree has got different wood on the north side from what it has on the south side, and when you plant you must plant in the same way it stood before.

Mr. O. M. Lord: I would like to know whether anybody has ever paid any attention to that.

Mr. C. M. Loring: I have not, but I thoroughly believe in it.

Mr. Yahnke: I always practice it, and I scarcely ever lose a tree.

Mr. Seth Kenney: I would like to ask Mr. Loring whether he practices trimming back the different kinds of evergreens?

Mr. Loring: All evergreens, as we know, must be handled in a different manner and are, in fact, entirely different from deciduous trees. An evergreen receives much of its sustenance from the air and less from the roots than the deciduous trees. We often see a large tree grow right out of the rocks and wonder where it gets its sustenance. It gets it from the top. We have planted a great many ornamental trees, and when we ask our gardeners to cut them back to make them more beautiful they rather resent it and do not wish to do it. If anybody would go to Lakewood Cemetery they will see trees that were properly planted and cared for, and they are beautiful trees, the limbs growing clear down to the ground, as all evergreens should. These trees were sharply headed in.

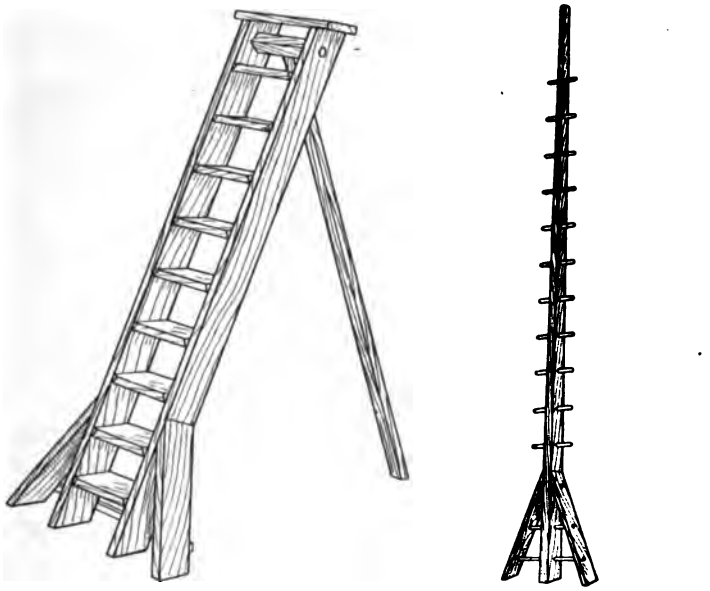
Prof. Hansen: I think Mr. Loring's plan is just the one that should be followed with shade trees. At the beginning of this discussion we were speaking about fruit trees. About cutting back shade trees to a pole when setting them out—I think they will suffer with sun scald of the stem. The stem stands there without any protection, and during the first season it becomes bark bound and sun scalded. We find that the protecting of the stem somewhat with a hay band is very essential to the health of the tree.

The President: I think that is true of some kinds of trees, like the box elder and the cottonwood. I never knew an elm or an ash to be injured on the south side by the sun. I went out with a neighbor at one time to get some elm trees to plant around our homes, and when we got through at night there was one large tree, about as large as my wrist, with one little root on it, the others having been split off accidentally. The first thing my neighbor did was to throw that tree away, and then he said we would divide the others. He said I should take first choice and he the next. I took my choice and he his, and then I picked up this one with the little root, took it home and planted it, and it stands in front of my house today. I cut it off five or six feet, cut it square off, left nothing but a pole, but in the course of a month it began to push out little buds, and it grew wonderfully, and I really think that tree was as good as any one of the lot I set out. It has grown right along without any set back from that time to this. Now, a word in regard to the wind blowing them over. I believe in thorough pruning when setting out the tree, but I also believe in setting them from six to eight inches deeper than they originally stood in the nursery, which, I think, will avoid that blowing out by the wind. If you get a tree down deeper than it was in the nursery row and then stamp it down well all around, the wind will ake the upper part of it, but it will not disarrange the roots nless you get a very heavy tree.

GATHERING THE INCREASING CROP FROM THE COMMERCIAL ORCHARD.

W. S. WIDMOYER, DRESBACH.

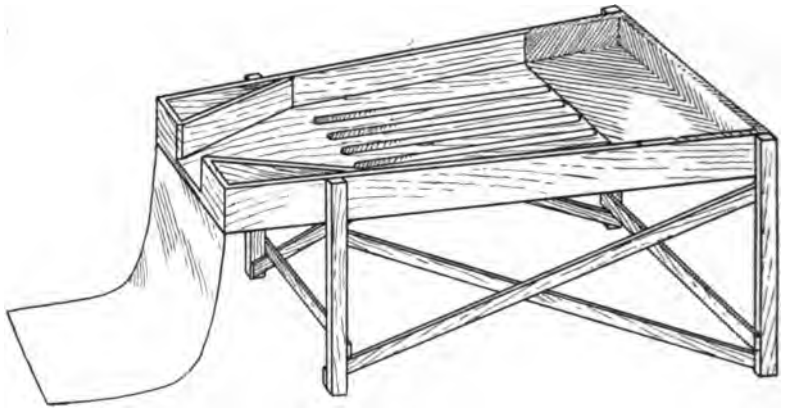
To gather the increasing crop of apples from the commercial orchard, one must have the proper tools ready in good season. These consist of baskets or bags to pick in, ladders of various lengths to reach the fruit, and if one packs his own fruit he will need a sorting chute, barrels, heading press and hatchet, head lihes and extra hoops.



Ladders for use in the orchard.

For gathering the common round half bushel splint basket, with drop handle, is the most convenient. They should be lined inside with burlap to prevent the fruit from bruising. The picking bag is a common grain bag with a stiff wire around the open end and a wide strap fastened at the top and bottom to carry it with. The strap is put over the shoulder, the open end of bag in front, which leaves both hands free to work with. I prefer the basket except when picking in the tops of tall trees, when the bag is most convenient. For ladders, the common step-ladders do very well for the lower limbs but are not the thing for the higher branches. For these a single stick ladder is used a great deal in the "Ozark" region. My objection to them is they bark the trees too much unless handled very carefully. About the best ladder for this work is a narrow

step-ladder with a single back brace, and side braces at the bottom. This can be placed in the branches much better than the common step ladder.



Sorting table or chute.

The sorting chute consists of a table about eight feet long, and four feet wide at the upper end and three feet at lower end. The lower end is made narrower still by putting in corner pieces which extend back about one third way on each side, thus leaving a space of only eight or ten inches for the apples to pass through into the barrel. These corner pockets, or bins, can be used to put the facers in while sorting. The sides of chute should be about six inches high all around, except the eight or ten inches at lower end. The chute should be just high enough at the lower, or narrow, end to set a barrel under, the wide end being four to six inches higher, so the apples will roll towards the barrel, the small and poor ones being picked out as they roll along. About three feet of the wide, or upper, end, where the apples are poured in, should be covered with burlap, with some hay or leaves underneath to prevent brusing the fruit. The center of chute should be made of one inch slats with spaces between them of three-fourths of an inch, to let leaves and dirt fall through. At the lower end should be a piece of heavy ticking or ducking, three feet wide and six feet long, to let the apples roll into before dropping into the barrel. This cloth is thrown over the barrel, leaving it slack in the center, and when there is a peck or half bushel of apples on this apron they are let down in the barrel without bruising them.

When ready to pick, two men with a team and low wagon take a load of empty barrels and distribute them between two rows of trees as thickly as necessary, so the pickers will not have to carry the fruit so far. After the second load of empty barrels they take

the full ones to the chute, which is set at some good place near the center of the orchard.

A platform wide enough to hold two rows of barrels is better than a box. There should be a two inch piece around the edge of platform to keep the barrels from sliding off.

A packing crew consists of four or five men, and it will take four to six pickers to keep them going, according to how thick the apples are and how close they are sorted, fifty bushels being about an average day's work for each picker.

We find that women and girls make good pickers for the lower branches; for getting up on the ladders, and especially around in the tops of trees, we have boys and young men, as they do not break the branches as much as heavier men. The pickers are instructed to handle the fruit as carefully as possible, as any bruised specimens are not taken as No. 1. The pickers empty the apples into the barrels very carefully, putting the basket down in the barrel before turning out the fruit.

Sometimes the pickers carry the apples to the sorting chute. If so, they usually take eight rows, setting the chute in the center of a square containing sixty-four trees, thus doing away with the team and two men; but the team is much to be preferred, as there is always more or less time wasted in changing the chute from one location to another.

In conclusion will say that it will keep a man busy to look after a crew of this size, as careless pickers will leave considerable fruit, or bruise it so it will not go for No. 1; besides they sometimes break branches off the trees unless closely watched.

Mr. C. L. Blair: I have had some little experience in packing fruit. My method may not be the best, but from my experience this method suits me better than any I have tried. I hire, for instance, five or six girls, and instead of using baskets I use sacks that hold a half bushel. A girl can put one of these sacks over her shoulder and get on her stepladder to pick, and if there are any apples that are not perfect they are put in baskets, that I call No. 2, and which I sell at home. I set my station in the most shady place in the orchard, to which place the girls bring their baskets, and then I have a man there to head up the barrels. The bottom of the barrel is faced, and all the apples are put in carefully, so they will not be bruised. By this method four or five girls will pick as fast as a man can head up the barrels, and we generally get from twenty-five to thirty barrels headed up with five girls and one man working. In that way it is not very expensive. That makes two loads a day to take over to the depot. About 180 barrels a week is what we get off. I find it is not very expensive to handle fruit in that way. We use a stepladder, a style of ladder that stands twenty-two feet high, and there is now and then a girl that will climb to the top of any ladder.

It is quite an advantage to have a man help the girls move the ladders. This method I have found to be the best in handling the Duchess. In the season of the Duchess, it is right in harvest time, when men are engaged in harvesting and threshing, and male help is quite expensive, while girls you can get for about 75 cents per day, and they generally do the work as well as men. This is the best method from my standpoint.

The President: In putting in the facing it is the custom in Minnesota to put the smaller apples on top so that the customer who buys will be agreeably disappointed to find that they get better as they go down through the barrel. (Laughter.)

Mr. Underwood: The last speaker uses the same method we have adopted in picking and packing apples. I have only one suggestion to offer in the matter of ladders that might be found to be an improvement. You can have ladders fixed so they will have two wheels under them in the form of a wheelbarrow, or in the form of a little cart, and you will only have to pick up the handles and move it around the tree. It is a ladder resembling the kind they use in California to pick oranges. Last summer we had carts made of buggy wheels, making a sort of push cart, and placed the ladder right on it. It has handles just like a push cart and makes a very convenient arrangement.

Mr. Beckley: I can see how they pick the apples from the center of the tree, but what do they do with the apples on the outside limbs that they cannot reach with their hands?

Mr. Underwood: You can run those ladders up to any tree I have ever seen in Minnesota.

Mr. J. S. Parks: I have made two or three ladders that are very cheap and convenient. Friend Philips has made one by cutting two small poles and bringing them together at the top. That makes a convenient arrangement to run up between the branches and even out on the branches. It can be handled very easily.

Mr. A. J. Philips, (Wis.): The end of the ladder will rest against a branch in the top, and I put a cross piece in the top so any one can stand on the top and reach all around. It is made of 2x4 stuff. It is the nicest arrangement I have ever tried.

Mr. Lord: How long are the side pieces?

Mr. Philips: They vary in length. I have one ladder on which the side pieces measure twenty feet.

Mr. Parks: I make mine of black ash poles I have growing in the grove. They are a little narrower at the top, about an inch and a quarter in diameter, but they are very strong.

Mr. Philips: I make that piece at the top just wide enough for a common shoe so I can step on either side of the ladder.

Mr. C. E. Older: We use an extension ladder like a fireman's ladder.

Mr. A. D. Leach: We use a ladder that is easy to make. I procure a straight tamarack pole about eighteen feet in length and about four inches in diameter at the butt and two at the top. With a rip saw I rip that pole to about nine feet from the top and put in a bolt and washer to prevent it from splitting further. Then I lay it

on the ground and bore holes for the steps with a two inch auger. Then I spread the bottom three feet wide and spring in all the steps except the last one next to the bolt, which I let run through seven or eight inches on the side; then above the bolt pieces are put through all the way to the top. That can be readily set against a limb in any shape without being interfered with. It stands very firm, is easy to climb and is light to handle and it suits me better than any ladder I have ever used. I think you would like it if you were to try it. It is just as handy to use as a farm ladder; it will adapt itself to the ground because the top can be turned in any direction.

Mr. Brand: We have two of those platform ladders on wheels. We use two wheels and let two pieces project back two feet for handles and have our platform built two feet high. The ladder is on the back end of the platform where we can get up. We can take that platform and run right up to a tree with it, and we can place it so we can reach all around from the top. Then we have small ladders, stepladders, which we can use on top of that platform if there are any other apples we cannot reach. Then we also have a ladder made very much like Mr. Leach's, only the rungs are grooved in and notched and they come to a point at the top, and at the point the edges are bevelled off so it makes a complete point that you can shove in anywhere in the tops of the trees. That is a very handy ladder.

Hon. C. M. Loring: "I became a member of this society some thirty-six or thirty-eight years ago. I saw the people come together year after year struggling with this problem of how it would be possible to raise apples in the state of Minnesota. All of us spent a good deal of money. We sent to nurseries in different parts of the country and got apple trees, but many gave up because they thought all their efforts would end in failure. A few of these gentlemen kept on trying to raise fruit, they spent thousands of dollars in their experiments, and now at last their efforts have been crowned with splendid success. Through the efforts of these gentlemen succor has come to us, and we have now passed the point where successful apple growing is any longer an experiment. I was told by some gentleman that we raised in the state of Minnesota something over 500,000 bu. of apples this year, and if that is the case it is astonishing. Now we want to turn our attention to producing commercial fruits."

Mr. C. E. Older: "There is nothing that I enjoy more than attending these meetings. I always appreciate the kindness that is shown me, and I hope we may have a more successful year following this meeting than we had last year or the year before. We are down in the southwestern part of the state, but we feel just as much interest in the work of the society as they do in any part of the state."

Trial Stations.

MIDSUMMER REPORTS, 1902.

CENTRAL STATION, ST. ANTHONY PARK.

PROF. S. B. GREEN, SUPT.

The very favorable winter and spring have left the horticultural work of the experiment station in excellent condition. The campus never looked as well as now, and there has been very little loss of any kind from winter injury.

Continuous rains during the time when plums were in flower are probably responsible for the fact that we shall have no plum crop this year. With us this is not so much to be regretted, as our trees have been bearing continuously and too heavily for a number of years, and this will give them an opportunity to recover and be in good shape for the next season.

The apple trees which bore heavily last year are without fruit this. We shall, however, have a small crop of this fruit. Currants and gooseberries blossomed well but were injured by the late spring freeze, and are rather a short crop. Strawberries are unusually good.

Our Ancient Briton blackberries, which were killed out two years ago, have recovered this year and promise to give us a good crop. Both red and black raspberries are heavily loaded with fruit. Our seedlings have come along very well, and the outlook is that we shall have this autumn from fifty to sixty thousand Pyrus baccata to spare. We also have good stands of buffalo berry, Russian olive, sand-cherry, plum, and high bush cranberry. Of seedlings of Beta grape and seedlings of best native sorts, we must have five thousand, which is rather more than we have room for fruiting.

LA CRESCENT TRIAL STATION.

FRANK I. HARRIS, SUPT.

After another exceptionally mild winter it was somewhat surprising to find both grape vines and raspberry bushes badly injured, but this is again attributed to a late fall growth and immature wood. No injury was observed in the orchard except that blossom buds were killed on peach trees. Never in the history of the station was there so good a prospect for a full crop of fruit and seldom has the realization been more disappointing, except in the case of strawberries. Plums blossomed profusely, but scarcely any fruit set and but little of that remains, and that little is of poor quality. A bonanza crop of apples was looked for after last year's failure, and the outlook never was brighter at blooming time, but continued cold and wet weather caused more than three-fourths the crop to drop soon after setting, and the remainder are liable to become cooked on the trees for the want of foliage protection, caused by blight, which never was so universal, both as to number of trees and varieties affected. While the outlook is not as flattering as hoped for a good stand remains on some varieties, and the quality is a great improvement on last year's grade. This is largely attributed to a liberal use of the spray pump, and the results would undoubtedly have been more manifest under different weather conditions. To use the spray pump every day for two weeks and allow it to rain every night is not a good combination for best results.

As if to make amends for damage sustained in the orchard, nature did her best in the strawberry patch, and the result was a good crop of this luscious fruit. While on some new beds the yield and quality were inferior, on the two-year-old beds the yield was enormous in some instances. The market was also in prime condition, and the man who had a bearing bed reaped a just reward for his toil. As usual, Warfield proved the best money maker and Bederwood the most profitable pollenizer, but good results were obtained with the Splendid, Clyde and Brandywine. Rough Rider proved disappointing as to yield, but in quality and firmness good. Among the best of the newer varieties that have come to my notice I would mention the Livingston, a staminate variety, said to be as prolific as the Warfield, and I can personally testify to the merits of its fruit, which is good every way.

Winter protection of raspberry canes is not practiced at this station, and, as a result, the crop was a meager affair. Cuthberts suffered most, but Loudon was also badly injured. The black caps were somewhat better but altogether a slim crop. The Columbian

came into bearing and appears to be very promising. Yield and quality of fruit ahead of either Gregg or Nemaha and apparently hardier than either. The cherry crop hardly sufficient to give the birds a taste.

Currants bore a good crop, but the bushes were badly stripped of foliage by worms. The vineyard looked like a cemetery till the middle of May, but did finally come to life, except the Brightons, which were killed to the ground. Campbell's Early was also so badly injured that no fruit will mature this season. Only a small crop was expected, and less will be harvested, as grape rot has put in appearance with disastrous effect.

MINNESOTA CITY TRIAL STATION.

O. M. LORD, SUPT.

The winter being mild, all fruits apparently wintered in good condition. The month of March was unusually dry and warm, causing buds to start on some varieties, which were injured or killed by the cold in April or May. Soft maple and cottonwood trees were particularly affected, so as to produce no blossoms. Also some apple, cherry and plum trees bloomed profusely, but the blossoms were remarkably deficient in pollen. Whether this was caused by the weather conditions referred to or from having produced a large crop last year, or from some other cause, it is difficult to say. What little pollen there was the rain and high wind effectually destroyed before maturity. Wealthy, Longfield, Hibernal and Duchess apples now promise a good crop.

The strawberry crop, where uninjured by hail, has been a fair one. For some unknown reason the Wm. Belt and Bederwood, though very large and fine last season, have rusted so as to be of no value this year, though placed in alternate rows with Warfield, Brandywine, Dayton, Mary and others, that were not affected.

Currants are a full crop. Black and red raspberry canes are drying up, with shriveled fruit, but the young canes are making a heavy growth. It is generally believed that raspberry canes were injured by the drouth last year.

The season has been very favorable for all newly set trees and plants, but blight upon the apple trees is much more prevalent than last year. Several varieties of apples and plums not heretofore tried here have been top grafted into bearing trees, and the scions set have made a heavy growth.

MONTEVIDEO TRIAL STATION.

LYCURGUR R. MOYER, SUPT.

The winter of 1901-2 was exceptionally mild, and yet it proved to be a hard season for all sorts of trees and shrubs. A hot, dry summer—the hottest for years—had been succeeded by a moist, growing autumn. Shrubs and trees that had lost their leaves in August began to grow again in October, and went into winter with the new foliage still clinging to them. When spring came there was much dead wood in the shrubbery.

The Eastern nine bark (Opulaster opulifolius) suffered severely, and on flat, level lands was entirely killed. It seems likely that the prairie nine bark (Opulaster intermedius) ought to be introduced into cultivation to take its place. Prunus Maackii suffered to some extent, and even the very hardy Russian almond (Prunus nana) was injured somewhat and gave less bloom than usual. The Russian Mulberry (Morus alba Tartarica) was killed back rather more than usual and is producing only a very moderate crop of fruit. The Manchurian maple (Acer ginnala), growing in a crowded border, was somewhat injured but is producing a full crop of its showy fruit. Clumps of choke cherry (Prunus Virginiana) were wholly killed. The last European larch (Larix decidua) gave up the fight, and the balsam fir (Abies balsamea), which had long played a losing game, turned yellow and died. The white spruce (Picea Canadensis) showed some injury, more so than did the slower growing blue spruce (Picea pungens). Douglas spruce (Pseudotsuga Douglasii) is holding its own well and seems to be about as hardy as the blue spruce.

A spiraea received from the Iowa Agricultural College under the name of Spiraea hypericifolia, and from St. Anthony Park under the name Spiraea oblongifolia appears to be Spiraea Pikowiensis. The flowers are greenish white, but it blooms very early and is very hardy.

The mountain ash spiraea (Sorbaria sorbifolia) is a beautiful, vigorous shrub, blooming at about the end of June. Spiraea Anthony Waterer is holding its own very well, and is in bloom at the present writing (July 15). Its corymbs of deep pink flowers are very showy.

We have discarded all the Russian poplars as being unworthy of cultivation, with the exception of Populus balsamifera intermedia. This seems to be a hardy, slow growing tree and possesses some merit for ornamental planting. Populus nigra is still doing very well and is of somewhat slower growth than the cottonwood.

Catalpa speciosa is becoming better acclimated here and is this year very luxuriant, blooming profusely. The wayfaring tree (Viburnum lantana) bloomed this year for the first time. Its flat cymes are quite beautiful and are produced somewhat earlier than those of the snowball. Its stellate-pubescent foliage has a velvety effect, and the general appearance of the shrub is quite pleasing. It seems to be quite hardy in well drained locations and is readily propagated from layers.

Polyganum Sieboldi has been growing at the station for several years. It is a rampant grower, spreading by underground rootstalks and maintaining itself without much cultivation. It reaches the height of about three feet, producing large tropical-looking leaves. A clump of it is very effective.

Another hardy perennial that pleases us much is the old fashioned blue larkspur. It grows to a height of about four feet, and its tall blue spikes are a marked feature of the hardy border.

An early spring flowering perennial that pleases us much is the Virginia cowslip (Mertensia Virginica). It blooms in April, producing a profusion of blue flowers, and like other natives requires but little care.

We are harvesting a fine crop of raspberries—Columbian, Caroline and Golden Queen. We lay them down and cover them with earth in the winter.

Currants are producing a larger crop than usual, and gooseberries have done better than for years. The plum crop is a failure; and there are but few apples. Hibernal, Wealthy, Duchess, Blushed Calville and Sweet Russet are producing a few apples. Blight has been very prevalent, originating on Transcendent and Yellow Siberian and spreading to the rest of the orchard.

PLEASANT MOUNDS TRIAL STATION.

J. S. PARKS, SUPT.

Trees and plants came through the winter in fine condition and have made extra large growth the present season, with no loss to mention except from blight. Apple trees have blighted worse than ever before—very few varieties have escaped. Tallman Sweet, Wealthy, Bradley crab and many others are nearly as bad as the Transcendent—even the Wolf River, that never lost a leaf before, is considerably affected. The Pyrus baccata, that can stand so much cold, can not stand our blight. Half of our seedlings of this crab are dead to the ground, and some grafts that I put on at the crown this spring have died from blight below the graft.

The fruit prospect is not very favorable. Apples dropped continually; then a wind storm took off half, leaving but a light crop.

Plums blighted at blooming time—curculios took the balance. Raspberries, strawberries and all other small fruit are yielding satisfactorily well.

The season has been very favorable for planting fruit trees, and large quantities of all kinds have been planted this season in this vicinity; and agents are taking large orders for future delivery, showing a renewed interest in fruit raising among the people.

WEST CONCORD TRIAL STATION.

FRED. COWLES, SUPT.

I cannot give a very satisfactory report at this time on the stock sent me, as the trial station was just placed on my grounds last spring, but everything set out has done well. The stock received was Russian olive, juneberry, Pyrus baccata, high bush cranberry and buffalo berry. It has been an ideal spring to set out stock.

We have just finished harvesting strawberries, the best crop for a number of years. I have been testing several new varieties of strawberries. Aroma: a good size; color bright red; fairly productive; will try it another year. Mayan's Favorite: too light in color and too soft; will discard this one. Senator Dunlap: medium size; good color; will give it another year's trial. I have found no berries equal to the Warfield, Lovett, Splendid and Enhance. The raspberry crop is almost a failure here this year. The varieties that do the best are Loudon, Older and Shaffer's.

Apples as a general thing are not a very good crop. Blight seems to be in the old orchards very badly, though it has shown but little on my grounds.

Plums blossomed full, but on account of too much rain at the blossoming time little fruit is set. The Compass has some fruit.

WINDOM TRIAL STATION.

DEWAIN COOK, SUPT.

July 12, 1902.—The plum crop is almost a failure, continued rains throughout the blooming period being probably the cause. The apple crop is also light, and the heavy winds of July 5 and 11 blew most of the few we did have off the trees. Blight made its appearance earlier than usual, and was quite bad early in June.

Strawberries did not seem to be fertilized as well as usual, and the crop was rather light.

Heavy and frequent rains have been the rule; in fact, we have had almost too much rain for all kinds of trees.

MINNESOTA'S INTEREST IN FORESTY.

GEN. C. C. ANDREWS, CHIEF (FOREST) FIRE WARDEN.

"Germany," said Prince Bismarck, "can organize a vast army because she has enough educated men for commissioned officers. It will not do for any of her neighboring countries to say they can do the same, for they cannot." So Minnesota by her natural advantages of climate and soil can do more in forestry than most of her sister states. Rain and sun do not fail; and in scattered localities she has in the aggregate about 3,000,000 acres of hilly, rocky or sandy soil on which coniferous forest will permanently flourish. If these three million acres were to be planted in the next eighty years, an equal proportion annually, at the end of that period and forever after, the state would derive from her forests a net annual revenue of $3,000,000, representing a capital of $100,000,000.

The great benefits to our state from such forests over and above the magnificent revenue in money would be: first, a regular supply of lumber, which will be very much needed when its population shall be 4,000,000 or more; second, the prosperity that comes from a multitude of laborers receiving steady wages in the forests and in the manufacture of lumber; and, third, those general benefits where the non-agricultural lands of a country are well forested, such as good roads in the forests, sustained water supply in streams, amelioration of climate and beauty of landscape.

The state will have to purchase a portion of these three million acres of non-agricultural lands in order to put them in forest, and a beginning should soon be made. But, probably 2,000,000 acres of these lands now belong to the United States; and it is not unlikely that our Minnesota delegation in Congress could have them granted to our state for forestry purposes. The lands would first, however, have to be examined by the United States geological survey to determine what subdivisions are unsuited for general agricultural purposes. The United States geological survey can make such examination without any further legislation. Those who feel an interest in the matter could properly write to their senators and representatives in congress on the subject.

This, briefly, is but one view of Minnesota's interest in the science of forestry.

Mr. Seth Kenney: "I have come to the conclusion that if a man wants to be in the line of progress he wants to join the horticultural society."

GINSENG AS A GARDEN PRODUCT.

HAROLD SIMMONS, HOWARD LAKE.

The cultivators of ginseng who have written or said anything about this novel industry agree that the thing of prime importance is to observe and adopt methods and conditions found to exist where the plant grows wild. A sandy loam, something that will not bake, is the ideal condition for growing ginseng; but an ordinary garden soil that will produce good vegetables will grow ginseng, when well spaded, with good short manure worked in at the rate of one barrow load to twelve square feet if the ground is ordinarily rich, will make an excellent bed. Shade of some kind is essential. I think artificial shade is preferable to natural shade from the trees, as it is hard to get the right amount of shade and sunshine too; it is either too much or too little of one or the other; while by using lath or brush on frames, one can adjust it until it is satisfactory.

It can be grown incidentally with gardening or farming, as it requires very little attention. Though no real cultivation is practiced there may be something to do in the way of pulling out sprouts and weeds. The cultivation in fact should consist of thorough mulching in the fall season, or at the time of planting. All weeds should be kept down. Unleached wood ashes is the best fertilizer to use. Each autumn after the plants die down a top dressing of some good fertilizer should be applied.

In starting a garden or plantation of ginseng, plant the seeds in rows about six inches apart and the seed about an inch apart in the row. Transplant the roots at two years old to four inches apart each way, there to remain until it is desired to dig for market. If starting with roots, set them four inches apart direct. If one can procure the wild plants it is much the cheaper way of starting, but takes longer to obtain results, as the plants under cultivation develop the root much quicker and yield seed much more prolifically.

Supposing we have one square rod set aside in the garden for ginseng and have it stocked with roots planted at four inches apart each way as stated, there will be eighty-one roots to the square yard or 2,470 to a square rod. Roots of four years' growth will average from ten to fifteen cents each—when dried for market, at present prices; consequently the 2,470 roots, valued at the lowest estimate (ten cents each) gives a return of $247.00 for one square rod. It takes from three to five years to grow a crop of marketable roots, which will no doubt deter a general rush into the culture of ginseng as a business, but the inducements are such as to lead enterprising people to cultivate this valuable plant.

The President: Ginseng! that was what saved us for two years at Hutchinson. The first year the grasshoppers came, the second year a hailstorm took everything we had, and the third year ginseng was our salvation. Then it sold at from five to six cents a pound, but now the price is up to its weight in silver, and seedsmen tell us we can make wonderful profits by raising it in our gardens. One of my neighbors has done something with ginseng. He has been about four years raising ginseng. He has forest conditions, having his ginseng garden established among the trees on the east side of the buildings. There are many different kinds of trees growing there such as one finds in the forest, and after so long a time I think the largest ginseng roots he has are about one-half the size of a lead pencil. I think in the course of about fifteen years he may get a crop of ginseng. All those that I have talked with tell me about the same thing. One man who has been in the ginseng business a great many years buying it, says he wishes they would keep right on trying to grow it so he could buy it, but he does not see any future for it. Ginseng all goes to China. The Chinese will work for $2 per month on their farms where we have to pay $20 per month. I am told they have the best soil in the world for the growing of ginseng. They have the cheap labor, the natural soil, the home market, and it is a grand one too, and if any one can raise ginseng in the garden it seems to me it is the Chinese that can do it. This is not a conclusive argument, but it is something we can think of before we invest in ginseng seed at four or five dollars per ounce.

Mr. McColly: I cannot say much in regard to the ginseng business, but I know that a man who expects to grow ginseng must have considerable patience before he will get any money out of it. But there is as much money in it as there is in any plant that grows. I have experimented for a couple of years on my own account to see what could be done with the plant, and as far as I have been able to handle the plant I have had very good success. I have started with the wild plants and they have made a very good growth; they have made a larger growth than they do in the wild state. The seed crop has grown wonderfully. I dug down to the roots this fall to see what the prospect would be another year, and I was surprised to find the growth the roots had made, and the bed is much larger than it was a year ago. I have only a few hundred plants. I was at Howard Lake visiting this fall, and I saw Mr. Simmons' garden. He has a fine little plantation. Of course, it is small, but it is only a question of time when there will be a large number of men growing the plant. It is possible in time to overdo it, but I believe there is money in it for the man who goes into it early.

Mr. Eddy: Mr. Simmons is a friend of mine. He has a very fine beginning. He had a great deal of trouble in starting right. There are little things about ginseng that have to be learned. He says his four year old roots are twice as large as in the wild state, and cultivated plants will produce one hundred seeds to one or two in the wild state. He is selling seed and roots both, and I believe

he would make a success of it if he should ship it to China, but he has a demand at home for all the seeds and roots he can raise at the present time.

Mr. J. F. Empenger: I have been in the business for about two years, and I have had success from the start. I have planted from the roots, because I could not get any seed. The wild seed did not come up. It takes eighteen months for the seed to germinate. Because it does not come up the first year many give up trying. I find it can be handled just as easily as a cabbage plant. I have not dug any yet so I cannot tell how large they have grown in two years time. There is money in the business at $5.50 per pound at home. There is certainly money in selling the seed, and there ought to be money in it when you can sell both the roots and the seed.

Mr. Rolla Stubbs: There is a neighbor of mine who commenced experimenting two years ago with a small bed. What he planted two years ago is coming up nicely, and he planted more seed this fall. He is making for it the natural conditions it finds in the timber. A shady location with sandy soil is the best place. He is experimenting for his own benefit to see what can be done with it. The young plants are coming up very nicely.

The President: Cultivation in time will work surprises. The burden of my thought so far has been that I have not heard of any one selling the plants, and I cannot get over the fact that the Chinamen do not raise it with all their facilities. They say it brings its weight in gold in China.

Mr. C. B. Waddell: My father has been experimenting four or five years with ginseng in Illinois, and I thought it was a streak of insanity cropping out in the family, but I must write home that there are some here taken the same way. (Laughter.)

Mr. Bush: I think it compares favorably with the Belgian hare craze. When you could sell them from $15 to $500 it was very profitable, but when the craze died out you could not give them away.

Mr. Ditus Day: "I am one of the oldest members of the society. I can remember the first meeting we held thirty-five years ago. I want to say that it rejoices me to see the growth of this society. Thirty-five years ago!—and there are very few of them left. I joined the society at the first meeting, and they met then in this city. I have enjoyed this meeting more than any I have ever attended. I am an old man now, but I hope I have done some little good. I am not a nurseryman, only a farmer, but I have produced one apple that is one of the best in the state."

Prof. Green: "I would like to hear from a man who always has good apples and has done much for horticulture in this state, but who has never said anything at these meetings. I refer to Mr. William Oxford." (Applause.)

PARKS FOR THE SMALLER TOWNS.

F. H. NUTTER, PARK ENGINEER, MINNEAPOLIS.

This subject that has been assigned to me, "Parks for the Smaller Towns," marks a change in public opinion. A few years ago it was considered preposterous for any but the larger cities to have parks. Perhaps it came about from the fact that Central Park in New York, and the parks in Paris had many artificial adornments, such as terraces, bridges, fountains, etc., which the photographer took as his subject, and so the idea came to be entertained that the principal function of a park was to furnish a location for those artificial adornments. In all those cases we know that the artist overlooked the great central feature of these parks. Olmsted, the elder, has emphasized the fact for years that the public park achieves its highest purpose only so far as it affords a chance for quiet rest among the beauties of nature. Now in these later days a change has come over the public mind. Things that twenty-five years ago were considered luxuries for the rich have now become necessities for all householders, so parks, once the luxury of the larger cities, have become the necessities of the smaller municipalities.

Now, it being conceded that a park is a desirable feature of any municipal household, the first thing to be considered is the selection of the site for the park. This park may be intended for ordinary park purposes, or it may be attempted to combine a play ground with it, though I think this will prove a mistake unless the area is extended, for the noisy games of the young people will not be acceptable to the older ones. So we will strike this feature out. In many of our villages and towns this question of site has already been settled by reserving in the platting of the town a small square or block in the center around which the farmers hitch their teams while they do their marketing, and on the fence of which they perch while they discuss matters of farm, state and church. Other communities have no site, and one must be acquired. In many towns and villages you may see tracts of land that are an eyesore and are perhaps used as common dumping ground. Still this very location may be the ideal one for a park, and if it is devoted to that purpose it will add to the health and prosperity of the community and become the center of attraction. It is perhaps not generally considered that a stranger can frequently see opportunities which the inhabitant by long acquaintance and familiarity overlooks. These sites, of course, where they are selected for their fitness, may not conform to the streets as they are laid out. It is one great difficulty that the park

makers and cemetery makers have to contend with, that everything is laid out in checkerboard lines without regard to the æsthetic side. So it may be that in order to secure the location desired we will have to disregard the surveyed lines and rearrange them in conformity with the contours of the grounds. Very often a village plat might have been arranged in the beginning so that these park sitet would have been provided and much useless expense in street grading avoided. I recall one small city in this state where diagonally through the village flows a small stream in a wooded ravine. The streets cross the ravine, and the people have hung the ends of their stables over the brow of the bluff and when high water comes in the spring the scavenger work is attended to, and the lake is there to receive the refuse. A little thought in the laying out of that village would have made that ravine a center of beauty, and the lots and streets along the banks would have afforded frontage for the most attractive residences. All that was overlooked, however, which with a little additional expense would have made this the most beautiful portion of the village.

The treatment of the site, of course, is the next question that naturally arises in this connection. I think I can safely say this, that it is always wise not to attempt too much. If we have an ordinary square or city block some artificial feature may be introduced, and all the rest should be a setting for it. A fountain or foliage bed might be the central feature of the design. A lawn should also be provided with plantings of flowers and shrubbery—but one great danger is the tendency, as has already been remarked, of overplanting. I remember visiting a city in Iowa a short time since, and while waiting for the train I looked over the city park of four or five acres, which had been "improved." These improvements consisted mainly in planting it so it appeared like a young forest, and they were continuing the work by planting some elms in a diminutive lawn that was still left in the center of the park. If we have one of these natural sites great care must be taken not to obliterate any of its native attractiveness. Artificiality must be kept in the background, and pains taken not to interfere with the natural beauty.

In closing I would like to say a word in regard to what I have already referred to, and that is the question of close planting. Of course, we hear it preached that the windbreak must be planted thickly (and it is generally thought necessary to plant close in our parks), but still it is a dangerous expedient to adopt, and you may be

sure that no one will have the nerve to undertake to apply the remedy when it is demanded. I could name a city in this state where I think if some "vandal hand" went through and swept it almost entirely clear of its present street trees, in twenty-five years it could be made almost ideal in its beauty, whereas now as time advances it can only go on from bad to worse.

THE NURSERYMAN'S PART IN LANDSCAPE ADORNMENT.

O. F. BRAND, OWATONNA.

It is true that in some respects the nurseryman occupies a place before the public paralleled by that of all tradesmen, although in many respects the field of his operation is wider and his responsibilities greater than in most other occupations. He is in a position where his advice is constantly sought and sometimes followed.

There are but few fields where better advice is needed than in landscape adornment, in the attempt to make the home surroundings at once useful and attractive. A few hints may be given from which broader ideas may be drawn and so help to obviate serious, expensive and oft-times irreparable mistakes. In most cases the advice given is by way of suggesting improvements to those grounds on which some work has been done. To give added beauty to all landscape scenery where possible and advisable is the nurseryman's work. I would not have the nurseryman take the field and work of the landscape gardener where there are men of that profession, but as a matter of fact except in large cities there are no landscape gardeners in this country; so the nurseryman, so far as recommendations are concerned, has to attach that profession to his own.

The man who has the natural ability of a first class landscape gardener added to that of a good nurseryman is in a position to accomplish great good in landscape adornment. He can and should materially assist in aiding the public to obtain a maximum of landscape beauty for a minimum of expense. To secure this much desired object it is not necessary that there should be a large outlay of time or money, for numerous instances are not wanting where $100.00 judiciously invested in flowers, shrubs, trees, vines, labor and paint have added more than ten fold to the selling price of the property. In order that the nurseryman may fully perform his duty along this line two things are essential: First, he must furnish to his customers the proper stock to be planted; second, he must be competent to instruct them not only how to plant, but also how to best arrange that which they plant so as to produce the best results in contrast effects.

While the operative details in this business are so many and so varied, depending so much on surrounding conditions as to forbid the laying down of specific rules in an article of this length, still we will name some things that may be done and some that should not be done.

1st. We should try to impress on the minds of our patrons that the best scenic effect is produced by contrast effect—sharp contrast of colors.

2d. Large growing trees should be planted forty feet apart or more.

The nurseryman should not recommend the planting of Scotch pine and Norway spruce where other evergreens can be successfully grown; should not advise planting trees or shrubs so as to obstruct a view of the buildings, nor tall growing shrubs anywhere on the lawn nor along drives—except in shrubberies; nor shrubs that bloom all at one season; or trees or shrubs liable to become breeding grounds for injurious diseases or insects—and except for windbreaks should not recommend the white willow or cottonwood where the sugar maple and linden can be grown. In fact, the useful only, other things being equal, should give way to those which combine beauty and utility. Where it is necessary to use tall, growing shrubs for screen he should not recommend lilacs if high bush cranberry can be had. He should not advise straight roads, driveways or walks in grounds where curved lines would produce a better effect; he should advise the planting of sugar maple, soft maple, American linden and, in smaller quantities, cut-leaved maple, Schwedler's maple, ash, cut-leaved weeping birch, American and European mountain ash, shell bark hickory, black walnut, butternut, European larch, white spruce, blue spruce, concolor, white pine, Austrian pine, balsam fir, dwarf mountain pine, Douglas spruce, American arbor vitae and silver cedar. He should advise groves of deciduous and evergreen trees—where possible with irregular outlines, with here and there small clumps of deciduous trees, not leaving out *one* of the varieties that produce beautiful autumn leaves. He should recommend large, well kept lawns where possible to have them, on and around which should be seen all of our hardy flowering shrubs, climbing vines, climbing roses and hardy roses. He should recommend LARGE MASSES of perennial and herbaceous flowers. In fact, in floriculture the impress of his work should be decidedly marked.

For early flowering, beds of white tulip with yellow or scarlet or crimson borders, or beds of scarlet and crimson tulips with a

single row of white for a border, should be seen around a score of homes where one is seen now. Moss pinks should greet the passer-by. For the latter part of May and early June tree pæonies, with their gorgeous colors, and all through June and into July selections from the long list of more than 700 distinct varieties of herbaceous pæonies, should be made to show forth the marvelous beauty and enchanting loveliness of God's new creations. The Great Father of all life has brought forth these new things, wonderful in beauty and loveliness for the use of *man,* and the nurseryman should see that they are used in larger quantities, both singly and in clumps and in large masses of a single color.

In the first half of the nineteenth century it was true that the rose was the queen of flowers. It is no longer true. The new creations in pæonies do not hold a second place. It is today the queen of flowers.

Large beds of coleus and of geraniums should be marked features. A large oblong bed of yellow coleus, with a border of single row of very dark color, produces a fine effect. In all arrangements of flowers, shrubs or trees, sharp contrast of color should be the rule.

For midsummer and autumn flowers the perennial phlox should be used in large numbers. These are also new creations, more than one hundred fine varieties having been brought out during the past twenty years. Their effect on the lawn is pleasing and lasting. During a trip east several years ago, of the things seen none made a more lasting impression on my mind than the beds of perennial phlox on the grounds of Elwanger & Barry, and a single clump seen on a well kept lawn at Burlington, Vt.

The space allotted me is filled and in closing let me say, that if the nurseryman carries out the suggestions herein contained, when he passes to the life beyond he will feel that the world has to some little extent been made more beautiful and happy because he has lived in it.

Mr. Wm. Oxford: "I am not much of a speaker, but I have grown fruit for a number of years, and I always try to raise the best fruit. I joined this society a number of years ago, and I always take great interest in reading the monthly magazine. I thought it was my duty to come up here, and I must say I enjoyed the meetings very much, and hereafter as long as I live I shall expect to attend."

ORCHARDING IN MINNESOTA.

E. H. S. DARTT, OWATONNA.

I planted my first orchard in Minnesota in 1869, and have kept right at it ever since, and have probably planted more than 10,000 orchard trees, two-thirds of which are dead. About twenty-five years ago I planted an orchard of 2,500 trees. It was mostly on a northern slope. I put a windbreak on the south and west, that trees might protect each other. I planted them twelve feet apart each way. Every fifth tree in every fifth row was Scotch pine, making pines sixty feet apart all through the orchard. The holes were dug the fall before, and trees were set very early. Some holes were half full of ice. I think every pine grew and of 1,600 apple trees set that year only four trees failed to grow. I set in this orchard about 800 Duchess, 800 Wealthy, 200 Tetofsky, 200 Haas and 50 trees each of Orange, Maiden's Blush, Quaker Beauty and Minnesota crab; also a strong sprinkling of other varieties of apples and crabs.

The winter of 1884-5 killed to the ground every Wealthy and Haas and many of the other varieties. This is the reason why I said the Wealthy was not hardy enough for Minnesota Most of the dead trees were dug out and replaced largely with Duchess. This was a sad mistake, for the Wealthy trees left soon sprouted up and commenced to bear and are now the most profitable trees in the orchard, while the Duchess, though profitable at first, are now of little value for market purposes. I have sold five bushels for a dollar and hundreds of bushels have rotted on the ground

Enough Duchess have died from sunscald and root-killing to keep trees from crowding till about five years ago. I then commenced cutting out the pines to make room for apple trees, and to cut Duchess where crowding other varieties. I am also top-grafting alternate Duchess trees with Wealthy and Peter, which take well on the Duchess as a stock. I have girdled this orchard with a view of checking growth and producing fruit, but girdling is not to be depended upon alone for thinning out the orchard—branches should not interlock, and I recommend the liberal use of the axe.

Next year will be the bearing year, and I shall remove the fruit on a lot of my Duchess trees and girdle the first of July for fruit the next year, for I know there is money in the Duchess when the other fellows do not have any to sell. I do not know how much of the $500 received the past season came as the result of girdling.

Secretary's Corner.

PRESENT MEMBERSHIP OF THE SOCIETY. — The last membership, entered on July 29, brings the list of the society for 1902, including life memberships, to 1214. This is high water mark for the Minnesota Horticultural Society.

HAVE YOU MADE YOUR ENTRIES FOR THE FAIR? — If not, please look the premium list over and do this at once. Plan now for whatever you hope to do in connection with the fair and make the entries accordingly. If later developments require a change it can of course be made. There is no enterprise in which previous preparation pays better than in exhibiting fruit at the fair. Aside from the advantage to the exhibitor to make early entries, it is also a great convenience to the office management of the fair, who are always overwhelmed with such work at the last moment.

BEREAVEMENT IN THE FAMILY OF JUDGE L. R. MOYER.—Great sorrow has come into the family of our esteemed fellow member in the death of his son, Waldo E. He was a very promising young man of 22 years, with whom the writer had a pleasant personal acquaintance. At the time of his death he had completed his third year in the State University. Judge Moyer has a large acquaintance in this society, from his earnest work with us these many years, and his membership in the Executive Board for almost as long a time. He is assured of our profound sympathy in this affliction.

THE FRUIT OUTLOOK. — Reports coming into this office the latter part of July indicates a marked decrease in the probabilities of a good apple crop in Minnesota this year. Rain and wind, and perhaps other climatic causes sufficiently occult, are in the main the causes of this. The trees are making a fine growth however and, aside from the effects of an unusually severe attack of blight, are undoubtedly making preparation for a suitably remunerative crop in the future. The large sales of nursery stock for fall delivery as reported from the nurseries of the state show the faith of the people in the ultimate success of fruit culture with us notwithstanding this temporary discouragement.

NOTE THE STATE FAIR REGULATIONS. — There have been a few slight changes in the regulations of the horticultural department of the state fair from the previous year. Every intending exhibitor should read these over carefully and thoroughly inform himself. To comply with these regulations with exactness will increase very much the probability of success in securing awards. The rule requiring all exhibits to be in place and fully completed before the fair opens, at nine o'clock, Monday morning, will be adhered to as heretofore with rigid exactness. No fruit, except as noted in the premium list, can be placed upon the tables after that hour. The exhibitors have co-operated with entire willingness in the enforcement of this regulation and with most satisfactory results.

HAVE YOU EVER EXHIBITED FRUIT AT THE STATE FAIR? — If not this will be a good year to begin. You will not only receive some recompense for your trouble, but you will enjoy the opportunity to display your fruit alongside of that of other growers, and also meeting them. Most of the exhibitors, and especially the larger ones, spend the greater part of the week at the fair, and the opportunity to talk with them on this subject will be a very valuable one. If you are not able to attend the fair personally, and are willing to display your fruit there, please write to Secretary Latham in regard to it in good season. State fair premium lists can be had upon application to E. W. Randall, Secretary, Hamline, Minn.

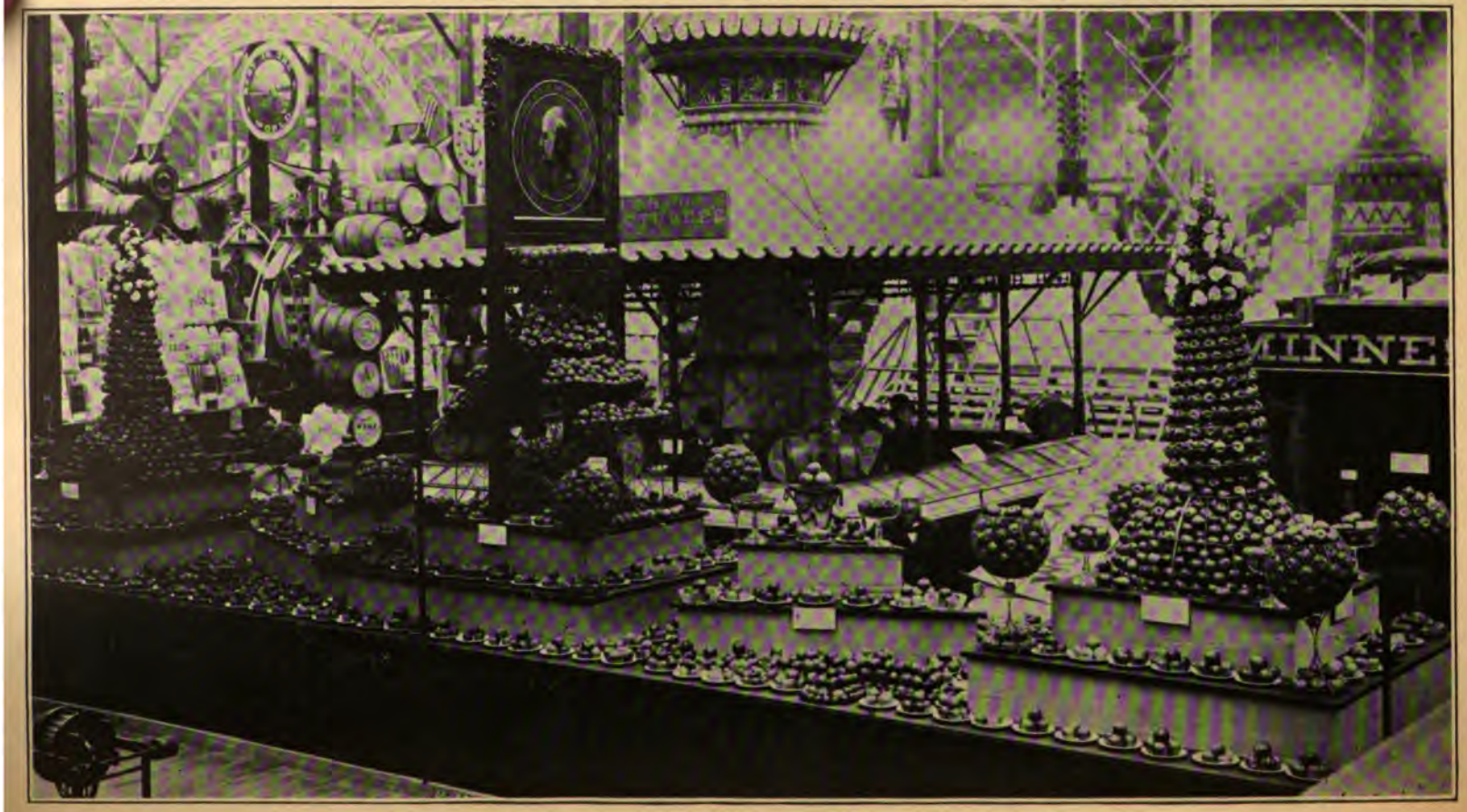
ABSENCE OF THE SECRETARY. — Callers at the office of this society during the last three weeks in July, up to July 29th, were disappointed to find the office closed. The secretary has been enjoying himself amongst the hills of New England in the scenes of his early life, not revisited before in forty-two years. He was glad to be able to go and not unhappy to be back again to greet the friends and workers at home. The office will be found open now as usual, and especially in the forenoons it is the purpose of the secretary to be on hand except in some unavoidable cases. The rule is — usually in afternoons; always in forenoons, with necessary exceptions. Come in and see what is doing — and remember that after all it is equally "your work" which is making the society such a force for good in the our chosen field.

FRUIT FOR THE WINTER MEETING. — Arrangements for storing fruit for preservation for this meeting have been made, as referred to in another note in this "Corner." It is our ambition to make this exhibit the best of all, and to this end we invite the help of all our membership. Premiums will be offered, as before, for named varieties of fruits, and the members are urged to save good specimens of any kinds they may have, and if they have not good facilities for keeping them at home send them to the cold storage provided. Shipping tags to be attached to packages for this purpose will be furnished by the secretary in any quantity desired. A special effort is to be made to secure a large exhibit of fall and winter seedling apples. The premium offered for them will be divided pro rata as last year, so that any exhibitor of a fruit of some commercial value will be sure of a share of the award. Don't fail to save specimens of any good seedling apples in your possession.

THE PROFESSORSHIP OF HORTICULTURE IN THE UNIVERSITY OF WISCONSIN. — A successor to the lamented Prof. E. S. Goff in the Wisconsin Agricultural College and Experiment Station has been found the person of Prof. E. P. Sandsten. The horticulturists of Minnesota have a special welcome for the newcomer from the fact that he is a graduate of the Minnesota School of Agriculture and also later from the full course in horticulture and forestry furnished by our state university, having taken his degree in 1895. An experience of some years in the management of the farm and garden at the Red Wing training school, and further study in his line in Colorado and at Cornell, have added to his fitness to fill this position. Mr. Sandsten is a young man thirty-five years of age, a native of Sweden, and is well versed in several modern languages. We expect him to succeed in the difficult position he has taken, and extend to him a hearty greeting and best wishes from the horticulturists of Minnesota.

COLD STORAGE FOR EXHIBITION FRUITS. — Arrangements, similar to those of late years, have been made for storing early ripening fruit for exhibition at the state fair, and later ripening for the winter meeting of this society, with A. Booth & Co., No. 205 North 5th St., Minneapolis. Fruit for the state fair will be placed in a temperature of about 40° Fahrenheit, which it is believed is suitable for keeping so short a time. Fruits for the winter meeting will go into a colder room, about 35°. As heretofore, exhibitors are urged to forward exhibition fruits to this storage as fast as they ripen, sending by express prepaid. All fruit so stored for the state fair will be delivered at Horticultural Hall there free of charge for storage or transportation there on Friday afternoon preceding the opening of the fair, in ample time for the exhibitors to arrange their displays. No expecting exhibitor should hesitate to avail himself of these facilities, which will decrease very much the inconvenience and expense of getting fruit to the fair, and increase correspondingly the probabilities of getting early ripening fruits on the table in good condition. Each specimen sent should be wrapt separately in paper, and all those of the same kind placed in a sack by themselves suitably labeled. Do as much of the sorting and arranging for the various entries as possible at home, which will decrease the labor to be done on the ground. Every package sent to this storage should have attached one of the printed labels prepared for this purpose. Send at once to the Secretary Latham for a supply. Under no circumstances put fruit for the state fair and winter meeting in the same package. Fruit for the winter meeting will be held till that time and delivered at the place of meeting on the day before its opening, also without expense to the exhibitor.

"FORESTRY IN MINNESOTA" REVISED — The revision of this popular work, by Prof. Samuel B. Green, horticulturist of the state experiment station, which was referred to some time ago in the Secretary's Corner, is now an accomplished fact, and the book is ready for distribution. As with the first edition, its use is especially intended for the forestry department of the Minnesota University. The changes and enlargements which have been made are such as are intended to add to its value especially in this direction. The first edition is in use as a text book in a large number of agricultural colleges and other schools of the country, and the new issue will have undoubtedly a still larger demand. It is a book of 400 pages, very handsomely gotten up and fully illustrated, a book that would sell easily, considering the size and style of printing, for $1.50, but as it has been printed by the State University it is offered for the cost of publication. It can be had upon application to the author, Prof. S. B. Green, addressing him at St. Anthony Park, Minn., and enclosing thirty-seven cents. This edition covers all the ground reached by the first one, but much improvement will be found in the classification and in a considerable extension of the first part of the book, which is devoted to elementary forestry. This takes up the subject of forest tree culture, both in the forests and on the prairies, including forest regeneration, propagation of forest trees, forest protection, mensuration, wood and its uses, forest economics, and includes, in fact, a very full treatment of all the problems relating to this subject. There follows this a description of the native Minnesota trees, and then a list of the forest trees of the United States, with a very convenient glossary and a full index. The book will be found exceedingly useful to amateurs, as well as to those who are taking up the subject in a technical way. This edition of ten thousand copies will be soon exhausted. Every member of the society should make application at an early date to be sure of securing a copy.



MINNESOTA FRUIT DISPLAY AT NEW ORLEANS EXPOSITION IN 1884-5.

(See page 356.)

THE MINNESOTA
HORTICULTURIST.

VOL. 30. SEPTEMBER, 1902. No. 9

Memorial Hour.

(ANNUAL MEETING, DEC. 1901.)

IN MEMORIAM: JOHN S. HARRIS, WM. MACKINTOSH, JUDSON N. CROSS, PROF. OTTO LUGGER.

The President: The exercises of this hour will awaken a train of sad reflections in the minds of all the members of this society. We were all or nearly all acquainted with these men, earnest workers in the horticultural society, these men who have left us during the year. Still we are glad to render this last sad tribute. We feel it is a duty incumbent upon us, and it is something we are glad to do.

The exercises were opened with a funeral march rendered on the piano by Prof. Rudolph.

The President: I will call upon Prof. Green to speak upon the characters of the various members of the society that have passed away during the year, and the loss to the society and the loss to the state.

Prof. Samuel B. Green: Mr. President, Ladies and Gentlemen of the Horticultural Society: These four names whose lives are the special subject of this hour are very dear to me. I have been severely stricken during the past year in that I have lost four good friends. They were all high minded men, they were all strong men. They were all men of broad character, working for the upbuilding of their fellowmen. They are all men of whom it can be said, the world is better because they have lived in it.

Mr. Owen, I understand, is to speak especially of the work of Mr. Harris, and Judge Hicks of the life of Capt. Cross. I wish, however, to refer to these myself.

Mr. Harris was a very dear friend of mine, and I have missed him in so many ways since he left us. At this meeting and at the summer meeting we have all missed him, his genial, kind ways, his helpful ways, and he had a place in Minnesota horticulture that it seems as though we had no one else to fit into. He was eminent as a pomologist, he had a national reputation; he was known as one of the best authorities on pomology in the northwestern states. He was looked upon as a very valuable man as judge by the different societies and was sent for on such occasions. His impartiality was a fine trait. When he had to say unkind things, or had to say the truth, which was a little rough sometimes,

he did it in the kindest way possible. I do not wish to dwell longer upon him, but I just refer to him briefly, as I know Mr. Owen will take up the work of his life and do it so much better than I can possibly do it.

Judge Hicks is to speak upon the life and work of Capt. Cross, but I have been asked to speak of his work in connection with Minnesota forestry.

When Capt. Cross took hold of the forestry movement in this state we had a new impulse. The forestry sentiment of this state and of the whole nation has been hard to crystallize. For years we had a forestry department, but it lacked crystallizing sentiment, it lacked some way of fixing the thought of the public, it lacked something that was practical, that could be done. We had enough essays of a general nature, what we wanted was something to crystallize the sentiment of the people, and that was where we needed a good lawyer. And that is a service that Capt. Cross has performed for this state; he was a pioneer. The law which he drew up establishing a forestry reserve board in this state is a model of its kind. It is referred to frequently in a very complimentary way by other sections of the country. It is an admirable document, an admirable law as he drew it up; but the legislature took out the most valuable part of it. If it could have been passed as he drew it up it would be a greater blessing than it is today, and I believe the time will come when the people of the state will use foresight enough to demand that the original bill be carried out and not the one today on the statute book, which is good as far as it goes, but has the power cut out that has spoiled the intent of the law. I believe the time is coming when we will want to do something better. But this is a great work that Capt. Cross has done. For a number of years he was president of the forestry association, and with his legal knowledge he was a wonderful help to it. He was always in favor of the forest fire law and frequently spoke in favor of it before legislative committees, until now it would be a very difficult matter to repeal it. At one time sentiment was so weak that the legislature passed a law repealing it, and nothing stood in the way but the hard work of Capt. Cross. His work was especially valuable because he brought his legal talent to bear upon the forestry question when legal talent was specially needed, and it was the legal talent of a pure, ripe mind, the mind of a lawyer of experience. It has been a great benefit to us so far and will be a greater benefit in the future.

Dr. Lugger was an associate of mine in the University of Minnesota for something over thirteen years. We started together in the School of Agriculture of the University of Minnesota when there was no school of agriculture, when the name of the agricultural department of the University of Minnesota was a byword, a contempt. It was not considered worthy of notice, the farmers had no time for it, it was the laughing stock of the people generally. That agricultural department has grown until today there is no agricultural department like that of the university, or any agricultural college that has a better experiment station than the state of Minnesota. That has come about through wise management on the part of the board of regents and the support given to the work by the

foresight of the people of the state of Minnesota; it has come also through the work of the loyal faculty of the School of Agriculture, and Dr. Lugger by his work throughout the state did much to make the experiment station a thing of vital interest to the farmers of Minnesota. In the early days it was the entomological department that brought the experiment station favorably before the people of the state by reason of the subduing under Dr. Lugger's management of the grasshopper pest in Otter Tail county.

Dr. Lugger was a good friend of mine. I used to love to go in and talk with Lugger. I say "Lugger," because we always spoke of him as Lugger. He was a German by birth and came to this country to avoid military service. He had a military training and soon found a position and was noted for the thoroughness of his work. He was first with the United States survey, then with Riley, and then came out here. His work was thorough; he was a man of wonderful versatility, and he had a wonderful fund of information. He was a man with a national reputation. If I ran across anything I did not know I talked with Lugger. I knew I could get something out of him, and the people of the state appreciated him so much that his fund of information was constantly being drawn upon from every quarter of the state.

I want to refer also to William Mackintosh. I knew him in Massachusetts about twenty-two or twenty-three years ago. I knew the family very well indeed. He came west for the health of his family. He was always known as a progressive man in agriculture, a man who was always in favor of education. He was interested in the agricultural societies of Massachusetts. He had charge of some of the best farms in the state of Massachusetts, and his work was always of a progressive nature. He was known for his genial nature, always ready with a joke and a good turn, and I know that many here who knew him as a good friend will miss him. He was not a man to push himself to the front, but his quiet ways will be missed by all who knew him. Speaking about educational matters, he was one of the first to bring his son to the school of agriculture.

I feel that I have taken more time than I ought to have taken, but it is simply because my heart is full. I would like to talk about the merits of these men, whom I can see almost as plainly as if they were before me today, I feel I could talk about them a long time. I feel that we have met a great loss, the state has met a great loss in the death of these people, and our society does well to honor their memory.

Mr. S. M. Owen: Mr. President, Ladies and Gentlemen of the Horticultural Society: I shall not attempt to speak of the life and history of Mr. Harris. It seems to me that it would be a work of supererogation at this time, for you all knew him so well, even if we had the time to do so. I rather choose to give to you some of the fruits of calm and deliberate reflection of my own that are born of the relations of many years' standing that I had with this man. I love more to talk of him as he was, as he appeared to me during the years I knew him than to engage in anything in the way of historical reminiscences or recollections of him.

JOHN S. HARRIS, THE MAN.

(An oration.)

S. M. OWEN, MINNEAPOLIS.

At this hour of commemoration—a holy hour it should be—there is a realization of an existing void here, of a vacuum that nature, with its traditional abhorrence of such a condition, refuses to fill, that was never before felt in the councils of this society. A personality is missing today that never was missed before upon a similar occasion. He, who was a god-father at the birth of this society, who was a loving and tender nurse in the weakling days of its infancy, who was an elder brother helping to direct its steps into paths of influence, power and usefulness as it grew into youthful virility, and who was a proud parent when this, the child of his love and solicitude, had developed into vigorous maturity, giving promise of long life and of perennial beneficence, is for the first time absent from the roll-call of our membership. This causes the void, produces the vacuum, creates a vacancy that refuses to accept a new tenant.

This absent one is our grievously lamented guide, counsellor and friend, our highly esteemed and beloved fellow member and brother, John S. Harris. Never before absent, never truant or tardy even; and nothing but the cold and sapless hand of death, beckoning him the other way, could make him so now.

Throughout its long life every meeting place of this society has been a Mecca to him whose memory we now commemorate, and this society has been the shrine in the Mecca before which he bowed in love and adoration to the god of fruit and flower that he loved to worship. Unlike the ordinary pilgrim devotee, he did not bring his faith alone to this shrine, but he brought *works* to prove that his faith was well founded. He had the faith of the most enthusiastic zealot, but it was not the faith of mere proclamation. He brought here the evidences of his own and others' achievements to prove that his faith was not built upon the sands, but, rather, upon the rock of demonstrated truth.

Mr. Harris believed that,

> "If faith produced no works, I see
> That faith is not a living tree.
> Thus faith and works together grow,
> No separate life they e'er can know."

His faith in the ultimate adaptation of fruits of required character and quantity to this region was one of his many rare and admirable qualities. I recall my first interview with him. It was after a winter that had so devastated orchard, vineyard and berry patch in this state, that it almost seemed like a notice served from

the great Court of Courts that further efforts in fruit growing here would be futile. Years of time and labor, a vast sum of money in the aggregate and hopes that had been growing stronger and stronger, until at last they seemed to have reached a long and patiently waited for fruition, were suddenly buried in one frozen grave!

Perhaps no victim of that disaster felt the loss it involved more keenly than Mr. Harris did. But though it may have depressed it did not discourage him. In the bright lexicon of the vocabulary of his faith there was no such word as fail! Though contending with the icy waves of adversity and tossed from crest to crest by the blasts that had shattered the hopes of thousands, he was supported by the life buoy of conviction that the law of adaptation to environment is God's law, and all that is needed to make it effective is faithful, tireless, undismayed executives of the law, of which, my lamented friend, John S. Harris, was one.

During that first evening with him he talked long, ably, and with the earnestness that makes common words eloquent, of how that necessary adaptation to our environment was to be accomplished. In those days a new hope was just becoming buoyant in the fruit grower's breast. Ice-armored Russia was sending to us her frost proof children of Queen Pomona. Surely, Russia's productions, the survivers of her frosts, snows and blasts, would survive and flourish in Minnesota's comparatively mild climate. But my mentor on that never-to-be-forgotten evening, so many years ago, gave emphatic voice to the conviction that the fruits of the future for this region would not be immigrants but native and to our manner born. It is not cold alone but climatic and soil conditions peculiar to ourselves that all our products must become adapted to before their ultimate possibilities will be realized here. This was his theory then, he talked and wrote voluminously about it since, and all the time the logic of events and the processes of nature were confirming him, and it was because he was thinking and working along natural lines. His ways were ways of pleasantness and truth because they were nature's ways.

It was this quality of head and heart that caused a prominent member of this society to say, during the last state fair, probably the first one ever held in the state that he did not attend: "We miss Mr. Harris continually. His knowledge of fruits was so complete that any disputed point regarding name or variety could be referred to him with the confident assurance that it would be correctly adjudicated." This was because his knowledge was based upon fundamentals. Experience, observation, memory, long and

effective study and thought, had so thoroughly grounded him in the details of his art that his opinion upon any matter concerning it might with much reason be called oracular.

But Mr. Harris was not a student of nature in her manifestations of fruit and flower alone; he saw and understood her through the birds and smaller animals of her creation. He loved these living creations; and he loved them wisely, not too well. If he had to slay any by reason of naturally predatory habits, he did it kindly and regretfully. Considerate of plant and tree, of fruit and flower, of animal and bird, he could not be other than considerate of his fellow beings, and so he was!

Our departed brother was ever influenced by a broad and enduring interest in the great cause of fruit development in this latitude. The plants and trees that he sent out for distant planting must be the best as to quality and so handled in packing and shipping that they would thrive abundantly, bless the planter with good harvests of fruits, and thereby encourage him to grow them more plentifully and inspire his neighbors to do likewise. That aspiration was a more potent influence with him than the making of his own reputation or saving his customers a few dollars or cents. When he saw inexperience, ignorance, or deceit, misleading or defrauding the buyers of nursery stock, it was not the sacrificed money on the one hand or the manifestation of dishonesty on the other that aroused his righteous wrath, it was thought of the disastrous effect such practices would have upon the fruit growing industry of this region.

We love our brother the more truly, we cherish his memory the more warmly by reason of the difficulties that ever beset the pathway of his achievements. Such men as he are never rich. Though poor, they are among the world's choicest philanthropists; yet theirs is a philanthropy that is not heralded in the sensational headlines of newspapers. The men who cause fruits to grow where none have grown before are not exalted while living, nor are cloud piercing monuments erected to them when dead. These things are for those who have acquired great fortunes, who have attained high official position in civil life, or those who have scarred the earth with ten thousand ghastly graves where no grave was seen before. Mr. Harris knew, and you his fellow workers know, that the applause of the world was not for him, nor is it for you. He wrought within the limitations of humble surroundings and of scanty means. It was not the world's applause that he aspired to, but his fellow's betterment. He knew that his epitaph would never be chiseled on lofty shaft, nor his praises sung under vaulted roof by choir and organ.

But he wrought none the less assiduously for all that. He took great pride in his work, and it was a commendable pride. He was proud in the belief that his were works that would live, and bless while they lived, those who would come after him. Epitaph in sculptured stone he may not have, but one is graven upon the trunk and stem of every tree and vine that he induced others to plant and taught how to care for. His praises may not be sung in cathedral grand, nor in the chambers of the great, but in grove, orchard and vineyard that he inspired the growing of the nesting birds will sing his praises with sweeter note, and for countless years to come!

He was not an educated man in the sense that familiarity with school and college curriculum imply, but he had natural intellectual gifts of a high order. His mind was clear and analytical. Problems that confronted him in his chosen work he solved as if by intuition. His theories were based upon reason, his philosophy was the best test of the soundness and conservativeness of his judgment. His convictions were clear cut and easily transmitted to others, because his courage of them gave others confidence in them, and because they rested largely upon his own demonstrations.

For one without a high education, and with no culture but that of self, Mr. Harris had wonderful ability as a writer. His style was at once easy, smooth and simple. He never found the least difficulty in making himself clearly understood, and through all his writings there ran a vein of candor, sincerity and mastery of subject that impressed the reader that he was perusing the words of a teacher upon whose instructions he could confidently rely.

The eulogist or biographer of Mr. Harris need have no fear of finding aught to mar his subject if he crosses the threshold of his home and learns the story of his private life. His geniality, his courtesy, his fidelity and consideration for others were not qualities for display in public or among strangers; they were parts of his life, and in no place did he live them so truly as in his own home; their luster was never brighter than when shining in his own family circle. His not luxurious but picturesque home on the lofty banks of the Father of Waters; its surrounding trees, vines, shrubs and flowers; the tools he wrought with, the books he read, the table he wrote upon, the spirit of his presence through and over them all, will amply justify pilgrimages by friends and disciples for many years to come. And the story of his home life that may perchance be heard there will enlarge the admiration and love of the pilgrims.

Loyalty to friends, to neighborhood and state was a part of his nature. After visiting sunnier climes, after a long visit to his native Ohio, or from any other protracted absence, he would return

with warmer love for his Minnesota home, where the best years of his life were spent, and where the sun of attraction was as great and the bud of promise as large as in any other spot on earth.

Of vices Mr. Harris had none. And if he had frailties or weaknesses of any kind they were the trademarks of nature testifying that none of her human productions are perfect in all respects. If he was weak in anything or anywhere, it was a trivial, harmless weakness. It was not a great fault, but rather a trifling misfortune. But his strength, immeasurably the larger part of him, was always the strength of usefulness, of helpfulness and of many-sided virtues.

And now, our beloved brother, since you have passed the portal that leads to the solving of the great and, we believe, the glorious mystery of death, your character, your works, your achievements have become hallowed memories and sacred realizations to those you left behind; they wreath the brow of your glorified spirit with the immortelles of their love. For your faith, zeal and industry while of us, you are admired. For what you accomplished in the work to which you were so ardently devoted, you are honored. By the example you were of what integrity of purpose, undaunted courage and loyalty to friends and convictions may accomplish, you contributed to the world's enrichment. By your many good offices in promoting the cause of this society, you made it your eternal debtor. For the many attributes of your nature that make remembrance sweet, we will lovingly cherish your memory while we live.

I do not feel justified in closing this unworthy tribute without testifying to my remembrance of and love for the other translated members of this society, who are remembered and revered on this occasion. Friends of mine they were, too, and I fain would speak such words of them as their work and character deserve. And not only of those whose names and virtues are mentioned here today, but those who preceded these last ones into the ranks of the great majority. But while I may not speak of them, I may join you in crowning the memory of each with chaplets of remembrance and affection.

As this society calls the roll of its dead, it has reason to be proud of the contributions it has made to the spiritual hosts; and the imagination need not be strained to see our brother, after he had "gathered the drapery of his couch around him and laid down to pleasant dreams"—awaking on the shining shore of the "Better Land" we all believe in, and there greeting, with the ready smile and genial manner we are so familiar with, the old friends and co-laborers of his well spent earth life.

The President: Now there will be an opportunity given for anyone to speak one minute on any one of the four whose names appear on the program, or of all four together. We would like to have him occupy just a minute in saying what he has thought of these men, what anybody would wish to say on an occasion like this.

Mr. Oliver Gibbs: Fellow members, I feel as though I could not let this occasion pass without adding my own words to help make up the record of the life of Mr. Harris. I could not say what I wish to say in one minute. I will not undertake to traverse the ground covered so ably, properly and eloquently by Mr. Owen, but I wish to call attention to a few of the characteristics of Mr. Harris which made him what he was. He was the best all round worker we had in our society. The portrait we gave him four years ago is now smiling down upon us. First, Mr. Harris was a man who could do any amount of work that to another one would seem impossible. Second, he knew that the only success in life was to undertake to do anything just as well as he could do it. Hence he was always thorough in his work. When we gave him a subject to investigate, his report will show without exception that he returned an encyclopedia on the subject so far as his time and opportunity would permit. Another thing was his dogged perseverance in pursuit of knowledge. Another was his alertness to catch everything that came to his attention. You remember how he used to sit here with his note book and put down everything of interest, not content with our usually very accurate report, but he always kept his own notes for reference. Do you remember the very last words he spoke at this meeting? One member said he thought the old members should be more retiring and not take such a prominent part, but finally he concluded the better way was to work away as long as they could. "Yes," said Mr. Harris, partly rising from his chair, "and die with our boots on." Mr. President, the ink was scarcely dry upon Mr. Harris' last work upon an agricultural paper here before we heard he was dead. The very last horticultural report contained his name; "he died with his boots on." He took them off when he was ready to leave this shore, but he put them on in the morning when he reached the other side, and that impression tells me that he is at work on the other side the same as he always was here.

Mr. S. M. Owen: I want to say, Mr. President, that it seems to me something should be said of this most excellent man, Capt. Judson N. Cross, upon this occasion. He was not so well known to you as was Mr. Harris, but he ought to be better known to you, a great deal. He was a man of most charming personality; then, too, he was a man of infinite patience and invariable courtesy. He possessed geniality and kindness, but the chief quality that should endear him to all of us who are engaged in promoting the cause of fruit and flower, plant and tree, is the fact that he found within his busy and exacting avocation, that of a lawyer, plenty of time to give thought and work to the cause that we hold dear. Prof. Green has said that Capt. Cross did this great work for the forestry interests of this state at a time when we needed legal talent to help along in that work, but it was not legal talent alone that Capt. Cross brought into that work, his heart was bound up in it over all. He felt the

need of a different administration, a different treatment altogether of the forest interests of this country, and impelled by that thought, by that love of a great cause, he did this work. He did it not because he was a lawyer; he did it in spite of the fact that he was a lawyer and that the claims of his profession were making very heavy drafts upon him all the time. It is not alone in forestry outside of his avocation that he did good work. We have in this city a monument to this disposition of his to do for the public regardless of what his avocation might be or his exactions; the best control of the liquor traffic in a city I ever saw in my life is in Minneapolis. It is not ideal, by no manner of means, but the limiting of that traffic to a portion of the city is, I say, the best control of the liquor interests I ever saw in any city. That is the work of Capt. Cross. You go into his church circle, go into his social circle, go where you will, there you will find the usefulness that came from the vigor and the strength stirred by the earnest and honest conviction of a desire to do the best he could while he was on earth for his fellowmen, for his state, for his country. I have known many men, of course, in my long life, I have been intimately acquainted with many of them, but there were some things about Capt. Cross that attracted me to him in a different way than I have ever been attracted to any other man. There was some sort of magnetic influence there that, when you came within its radius, you felt that at least you were in the presence of a man; a man in everything that that word should imply.

Excuse me, Mr. President, but I felt impelled absolutely to say these few words that many of you might know what kind of a man this society, this community, the country had lost in the sudden and untimely death of Capt. Cross, cut down as he was without a moment's notice, cut down in the prime of his life and in the midst of his greatest usefulness.

Mr. C. M. Loring: I did not intend to say anything on this occasion; I did not come prepared to say anything because I understood the program had been prepared, but I feel that as some of the speakers are not here I must say a few words both of Capt. Cross and my friend Mr. Harris.

Thirty-eight years ago I became acquainted with Mr. Harris, and two years after I had the honor of entertaining him at my house. I never had a guest who was more interesting. He was quite ill at the time, yet he was always so pleasant and so thoughtful about the house, and all his thoughts seemed to center upon what he could do for the improvement of this association. At that time we were just struggling along; everything seemed to be a failure, but he was full of hope. We had purchased trees and shrubs, as we all had to purchase them, from places so far south that when they were brought to this country they were almost invariably winter-killed. But Mr. Harris was full of hope. He said we would yet raise apples in Minnesota, and he predicted that Minnesota would sometime be the finest fruit state in the union. But time went on, and many dropped out discouraged. I see many about me, members of this society, who were largely buoyed up with the hope that was bubbling up from this man's good nature, and as

a result of this hope and encouragement which he held out we see today this grand showing of fruit in the next room.

I must say one word in regard to my old friend, Capt. Cross. I was introduced to him on the day he arrived in Minneapolis. I became well acquainted with him immediately, and I have been honored by his considering me a friend as I certainly did him. He was a member of the first board of park commissioners. He was indefatigable in his work. He had the enthusiasm of a man who loved nature, and the fact that we have one of the most beautiful parks in the southern part of the city is due to his foresight. He came to me and asked me to go with him to see a little lake in the southern part of the city, and at that time there was not one house about it. There was only one little farm house at the head of the lake, but not a street was laid out and not a house was near the border of that lake. I walked with him to this lake, and all the time he was telling me what it would be some time in the future, what his faith was in the future of the city; and he filled me with so much enthusiasm that at the next meeting of the board of park commissioners, through his introduction of the subject, the city of Minneapolis secured that now popular portion of the city known as Powderhorn Lake Park.

I will only add that when Capt. Cross died I lost a personal friend, the city lost one of the most public spirited of its citizens, and we shall mourn his loss for many years.

The President: I was very glad to see that door open and see Judge Hicks come in after we had given up seeing him, because I know there is no one in the world that knew Capt. Cross better than did Judge Hicks, and we should have lacked just what he is ready to give us to round out these exercises here this afternoon.

Judge H. G. Hicks here spoke at some length of the personal work and worth of Capt. Cross.

The President: I want to give time for each member who wants to say a word to say that word now. We have all seen from what has been said that Diogenes, if he had been here before these men whose loss we so deplore passed from our ken, he would not have had to light his lantern to seek for a man; he could have found him right here in this society. Let us have more like them. But I would say do not take any one of them for a model. He who undertakes to follow servilely any one else as his model is sure to fail. But let their lives rather be a stimulus to us who remain to do as noble things as they did and devote our lives to something that will be of use when we are gone. When they were speaking of Mr. Harris, when Mr. Owen was speaking of Mr. Harris' style of writing, about his simple earnestness, clearness, how everybody could understand what he said, and the character that ran through the whole of it, I wanted to add the forgetfulness of self that you noticed everywhere in his writings, in his presence, in his talks, in everything connected with the man. He never forgot his ideal, he never forgot the conditions that he had in his mind as being necessary to the great success of the undertaking which he was laboring for. That always stood before him like a beacon light. He did not think

of doing anything better than anybody else. I do not think the idea ever entered his mind; he did not think of surpassing others, but he thought to himself: What can I do to bring us all a little nearer to the goal that we all have in view? If there is any one that feels moved by the spirit to say a word let him do it.

Mr. A. J. Philips (Wis.): As a resident of an adjoining state I want to add just a word of tribute. I consider it an honor as a horticulturist, as a friend of Mr. Harris and as a friend of Dr. Lugger to say a word. I have thought since I came into this room that if the arrangement of the services of this hour could have been left with Mr. Harris he would have had it just as it is at this meeting. I thought he would have placed his picture where it is now, surrounded by an arch of evergreen, the emblem of immortality, and all his old friends present. I think everything is just as he would have liked to have had it. While you have expressed the feeling of the great loss you have met as a society and individually, we feel this loss no less on the other side of the river. When we wanted a man to judge our fruit, who we thought would do it honestly and with impartiality, we could think of no better man than Mr. Harris, and we had him for years until he declined to serve any longer in that capacity.

Prof. Lugger often came over to our state. He was a social, genial, whole-souled man as well as a man of great ability. I had a black insect devastate my trees one year, and I described to him what happened to my trees. Before I had concluded he said, "I know what you mean; I have got him here, I will show him to you." He found him in the second drawer of his cabinet, the exact insect that caused the trouble. In the death of these men we have met a loss as well as you.

Mr. O. F. Brand: I wish to say just one word in reference to these old friends. Of course, anything we can say will not add to or detract from their merits, and all we can say is in praise of their noble characters. I liked all three of these men. Mr. Harris, Capt. Cross and Dr. Lugger were all men that I admired. I knew Mr. Harris since 1866, and I want to say of all three of them that what they did they did well.

Making a Windbreak.—"The trees to be used for a windbreak should be planted only on the side from which the prevailing or injurious winds blow, not entirely around the orchard. The kind of trees used will depend on the character of the winds to be excluded, the contour of the land and the kinds which thrive best in that particular section. If the wind is strong, but warm and moist, such as that coming over a large body of water, the windbreak should be of deciduous trees, such as maples, poplars and willows. The object in this case should be to merely break the force of the wind, not to keep it out of the orchard entirely, since it is injurious simply because it is strong.

GROWING STRAWBERRIES AND STRAWBERY PLANTS.

B. T. HOYT, ST. PAUL.

Growing strawberries is one business and growing plants another. I will try to touch on both.

Those of you who grow or have grown strawberries know how nice it is to see the large, luscious fruit ripening on the vines. To pick and eat one's own berries or have a fresh dish of berries is way ahead of shop worn stock, which sometimes has begun to sprout.

It seems strange that more people do not grow their own berries, and especially the farmers. No wonder there has been such a rush of young folks from the country to the cities. There are hundreds of farms without a sign of a fruit tree or bush. But these conditions are bound to change. People are beginning to open their eyes to the fact that Minnesota will and can grow as good fruit as any state, and *better* than a great many

Perhaps one of the greatest drawbacks to the farmers has been that, either through neglect or poor plant stock, they have failed and given up trying to grow fruit. Too often plants from old fruiting beds are used for planting. Some make a *specialty* of buying up old strawberry beds, which are exhausted, to send out plants from. This class of men can supply any named variety from these old beds. After trying these plants no wonder people give up.

Growing strawberries is not so difficult as some imagine, if the person starts right, then furnishes the proper conditions. To get the very best results one should first join the Horticultural Society, which only costs $1.00. Mr. Latham will take your money. Then get the best plants obtainable from newly set beds, one year old; set them in good soil which has been well prepared or any good garden land; then give them good cultivation, pinch blossoms off and keep weeds down. The better care the plants receive the better returns one can expect. Don't think that to stick plants into the ground is all there is to berry growing. There are many good varieties of strawberries and many poor ones, but each person has his favorite. One of our veteran strawberry growers said that it did not matter so much about the variety as it did the man that grew them.

There are several systems of growing berries for fruit, but in dry seasons if plants are growing in hedge rows or hills we find that they withstand the drouth much better than in the matted row.

Most people allow the plants to mat too thickly, and when the drought strikes them the plants sap one another, and the berries dry up for lack of moisture. If plants are set eighteen to twenty-four inches apart in the row, let two runners from each plant fill up

the spaces equally, which leaves six or eight inches between plants; if to be cultivated with a horse, have rows three or three and one-half feet apart. All other runners should be clipped off as fast as they appear, and plants will stool up to an immense size. In this way each plant sends its roots out in every direction in search of plant food and can be depended upon to mature a good crop. The whole surface can then be cultivated and mulched, which also has a tendency to retain much more moisture than by the other systems.

After good cultivation has been given the first season the plants are mulched and prepared for winter quarters. Winter covering is very essential. Perhaps the material most commonly used for that purpose is straw, but marsh hay is good, or anything that will protect the plants from freezing and thawing and is free from weed seeds.

There are several ways of propagating strawberry *plants,* but I will give but one along the line we are working.

A strawberry plant, although a small affair in itself, has the power of doing great things if handled properly and given the required conditions. It has been our aim to try and improve the varieties of strawberries we are propagating the same as animals or fowls are improved.

In order to do this we secure the best plants obtainable to start with, of the standard varieties. A plant is like a young animal, and needs the proper care from the beginning to get the best results. If a calf gets a setback when young, it never wholly recovers from the effects. The same applies to a plant. Although it *may grow,* it will not be profitable. Cultivation, plenty of plant food in the soil, early planting, when there is plenty of moisture, and restricting blossom bearing, are all very important factors.

We make our standard high in selecting plants to propagate from, and no *second plants go*—only to the *dump.* In the propagating patch runners are layered by hand and not too closely together, as the plants need sunlight to get best results, and they also need plenty of rootage. When plants are layered the parent plant is then relieved, and the new plants have a better chance to become established and mature before fall. We cultivate after every rain and often during dry weather, with the "Planet Junior" 12-toothed cultivator, with pulverizer attachments, which leaves the ground as level as a floor and the soil fine as can be made with a cultivator.

There is also a runner cutter attachment, which clips runners when growing berries in hedge row or by the hill system, and we also use it late in the season to clip the last runners off, as they are poor, weakly plants.

In the fall plants are covered carefully the same as for fruit bearing, because more plants are damaged from freezing and thawing than from any other cause.

Plants are dug with a six-tined fork in such a manner that the crowns are not damaged, and roots not exposed any longer than absolutely necessary. They are then culled out, trimmed, tied in bunches of twenty-five, labeled and packed in moss ready for shipment.

SCHOOL GARDENS.

F. M. POWELL, M. D., GLENWOOD, IOWA.

Whatever our natural endowment may be, environment principally makes up our character. When we consider how varied our surrounding conditions may be, the adage,—"No two persons are exactly alike," does not seem strange.

Pedagogy has been struggling for centuries past to determine the correct route to mental development and character. Theories,—often called fads,—are frequently being heralded by the school master, but it is not positive that they clearly and fully meet the requirements, for the reason that to us there continues much mysticism surrounding our plastic or developmental period. "Child Study" has been the advance cry in educational circles for years past. This study has confirmed advanced opinions in favor of manual training and nature study for the young. This paper aims to illustrate or support the introduction of "School Gardens" as a part of the child's school curriculum, which we consider as being in harmony with the views generally expressed regarding this natural training process.

Before speaking definitely on our subject, let us notice briefly what is being done in Europe in this line. In the annual report of the commissioner of education for 1897-1898, I find an interesting historical report of Dr. Carl Rutland, on School Gardens in Europe, indicating the extent to which they are introduced as an aid to rural school work. In part he says:—"As early as the beginning of the fourteenth century, in some cities of Italy, for instance, in Salerno and Venice, institutions were found in which plants from all parts of the world and every climate were cultivated for the purpose of instruction and the promotion of science." * * * He further states that in Germany also a great zeal for botanical gardens has been noticeable since the close of the 16th century. Their establishment is usually simultaneous with the foundation of universities. At present no German seat of higher learning is without such a

garden, which furnishes the material for instruction in botany and serves in many ways for experiments with agricultural plants.

"Sweden has made the widest extension in the development of the school gardens. Scarcely any public school building there is found without such a garden. Thirty years ago 22,000 children were instructed in horticulture in Sweden. There are many gardens in Belgium, where a large part of the population depends upon truck gardening, the result of which is attributed primarily to the school garden and the extensive knowledge of horticulture among the people. France also is doing much work along this line, there being 28,000 elementary schools, each with a garden attached. Many communities in Switzerland are giving attention to school gardening, and they are gradually increasing in number. The government encourages them in this work.

"The law in Austria prescribes instruction to be given in agriculture in all normal schools, and ordered the establishment of school gardens in villages, for the purpose of aiding agriculture, and provides also that instruction in natural history be connected with work in school gardens. Mindful of the pedagogical and economical importance of school gardens, the school authorities of Austria aided the establishment and maintainance of these gardens and paid much attention to proper plans, so that Austria has been able to overtake other civilized countries in that particular feature of education.

"The flourishing fruit culture of Bohemia can chiefly be attributed to the instruction which the inhabitants have received in the school gardens attached to local public elementary schools.

"The system adapted and successfully applied in Possneck, in Thuringia, the birthplace of Froebel, is referred to as a typical European application of the methods in question. Here the pupils come every day to weed, water, hoe, train or otherwise attend to and reap what they have sown. Parents come there to promenade and to encourage and help their children. In addition to the beds for vegetables, the garden contains a tree nursery and sections for industrial plants, hemp, flax, wheat, corn, rye, etc. Collectively these countries have now not less than 45,000 elementary schools with school garden equipment."

In the face of these facts, it seems strange that during all this time nobody thought of establishing gardens for lower schools. Commenius, it is true, expressed the desire that every school have a garden in which the pupils could delight their eyes in seeing trees, flowers and herbs. He saw in the school garden a means of awakening and nourishing the desire to learn. Also Pestalozzi, so enthusiastic for youth and popular education, demanded that children

should be engaged in work in gardens and fields; but this demand was dictated by purely pedagogical considerations.

The real garden movement for children, is due, I believe, to the kindergartners. They recognized the value that Froebel attached to a garden where the children might work. He said:—"Let your child plant his own garden, gather his own harvest of fruit and flowers, learn through his own small experience something of the influence of the sun, dew and rain, and gain thereby a remote presentiment of the reciprocal energies of nature and a reverent feeling for the divine life and law expressed in nature."

In harmony with the foregoing, it appears to the writer, that kindergartners could advantageously devote more time to nature study, and less to occupation gift work and rhyme singing.

So far, comparatively little progress has been made in the way of introducing school gardens in the United States. It is evident, however, from reports in educational journals, magazines and newspapers, that our country is being awakened on the subject. As stated in a previous paper by the writer, New York has made considerable progress in nature study:—gardening, horticulture, floriculture, etc., for the young. The stimulus emanating from Cornell University, under the direction of Prof. L. H. Bailey, has resulted in giving this school feature an impetus that grows in strength yearly.

Much progress has been made in a number of schools in and adjacent to Boston. Prof. Henry Lincoln Clapp has been prominent in assisting this part of the school work. In one of his articles, he mentions successful gardening being done in connection with the Curtis and Swan schools, also in Trenton, and one in Bath, Maine. The teachers' reports of their experience with pupils who work in these gardens are full of interest, indicating the benefit to be derived from this part of their school work. I quote the following from his report for 1899:—"A considerable amount of such work in connection with our public schools, especially in the west, would make young people more contented and successful in farming, and keep them from rushing into the cities to become clerks, conductors and genteel non-producers."

I should mention that the school gardens at Dayton, Ohio, under the supervision of the National Cash Register Co., were among the first to make tangible efforts in this country to develop school gardens. In these gardens, the factory furnishes tools and employs an experienced gardener who instructs the pupils in methods of planting, culture and harvesting.

Seven years ago, work of this character was commenced at the Glenwood Institution, and has been since kept alive annually with

continued improvement. Indicating what is being done here, and to bring out clearly what a school garden is, I quote in part from our teachers' reports for this year:

Primary Class: In a lesson preparatory to working in the school garden, eight kinds of seeds were shown the class, and each member given an opportunity to name them. The seeds were radish, lettuce, onion, beet, peas, beans, corn and oats. Two children recognized six of the eight, one recognized five, another four, and the rest from one to four. By one, lettuce seeds were said to be tea. By another, radish seeds were called potato seeds. Another "seeker after truth" put a small black seed into his mouth and quickly said "that's onion," and afterwards it was a favorite pastime to taste those black seeds and be sure of the onion flavor.

All had a vague impression that if you wanted lettuce, you planted lettuce seed; if radish, radish seed; if potatoes, potato seed; but from lack of actual experience there was very little definite knowledge.

A circular piece of ground seventy feet in diameter had been given us for a garden. This was divided into sixteen beds, and as there were thirty-two children in the class, two children entered into partnership for each bed. They were to prepare the soil, plant the seed, care for the growing plant and reap the harvest in their own particular bed.

As work progressed, notes were kept by the children. On the first page, I find this written:—"On Monday, April 22, our garden was ploughed and harrowed. Tuesday morning it was divided into beds, and paths were made. Tuesday afternoon, April 23, we all went to the garden to plant seeds. One bed of potatoes was planted; the beets for seed; the oats, the sweet peas and asters. On April 29, Willie and Valentine planted cucumber seeds. Ray and Harry planted beans. Hattie and Bessie planted zinnias. On another day, May and Mamie planted corn, Mary planted dianthus seed, Harold planted marigolds, balsams and bachelor buttons, and Anna planted nasturtiums. The report goes on to show the interest manifested by the children in watching the growth of their plants, and also speaks of their harvesting vegetables. On May 20th, ten dozen radishes were gathered and sent to the schoolrooms as treats. Later the dining room tables were graced from the children's gardens. One day there were as high as twenty-two dozen radishes taken from their garden to the dining room. On Sept. 1st, when the children and teachers had returned from their vacation, the garden was visited, and many of the children wanted to begin making garden again. It was explained to them that fall was approaching and winter was coming,

so that it was not proper to make garden again until next spring. They were all interested, however, to examine the results of the summer's growth. One little fellow remarked,—"Oh, Miss Barton, come here! Do look! I have found some corn! Yes sir, some sure enough corn!" The boys begged for some ears to take to their chickens, and it was granted them. They cut the fodder and fed it to the horses. The teacher remarks that,—"One year's work has made them more keen in observation and in appreciation of all nature and, I believe, more thoughtful." The garden has furnished material for drawing and painting lessons; field products will be made the basis for many winter studies. Beets will furnish lessons on sugar industry; tomatoes will introduce the subject of canning factories; wheat will be followed through the harvesting, threshing, milling and baking processes. Bulbs, annuals and perennials will also receive attention.

The kindergarten school also had their garden. I quote in part from their teacher's report: "What kind of seed did we plant? Why, there was lettuce, radish, squash, cucumber, corn, beets and beans. All the corner beds were planted in flowers. As the little plants grew, the time for hoeing and weeding began. The intelligence in using garden utensils, and their skill in handling them was a surprise to me. Not a weed lived there to disturb the growing plants. Soon we had a good sized bed of lettuce and radishes ready for use. These, with the help of bread and butter, served as refreshments at many a kindergarten party, and made a fine lunch when we walked in the woods. Some of them found their way to the kitchen to be prepared for the children's and teacher's tables." The report contains many interesting incidents, which cannot be inserted here on account of space. I quote further, however, from this report. The teacher states: "After having these experiences with the children, I was more deeply impressed than ever before with the importance for educational purposes of the close and intimate acquaintance to be obtained with nature at first hand with real things and materials, through the actual processes of their manipulation and the knowledge of their social uses and necessities. No number of object lessons, gotten up as object lessons, for the purpose of giving information, can afford even a shadow of a substitute for acquiring an acquaintance with the plants of the farm and garden as actually planting them and caring for them.

"I cannot tell fully of the satisfaction and delight that came to many little hearts during those days of such close communion with nature. How many lessons of helpfulness were learned, and to how many opportunities came for self-expression, when all other

avenues seemed closed. I, as teacher, felt the true significance of Froebel's words, when he said, 'Come, let us live with the children.' After the vegetables and seeds were gathered and put away, one little fellow asked, 'Will we have a garden next year, Miss Roby?' 'Yes, Ernest.' 'Oh, it is so long to wait, I'm afraid you'll forget it.' "

It is well to remember that entomological studies may be very appropriately carried along with garden work. Bees perform a very useful labor by conveying pollen from flower to flower. Butterflies and other winged insects afford an interesting study. Even the common toad, that inhabits the garden, furnishes valuable study lessons for children. Insect pests that are a menace to gardening can also be intelligently studied in connection with the garden exercises.

It is a common observation that children are inclined to loiter around school buildings and mar the walls. To obviate this, several years ago I planted annuals, perennials and shrubs around our cottages, ten feet from the walls out. The result was an attractive border around the buildings, an attraction for the children and an absolute protection to the walls of the cottages. And by these means nature lessons from the wall gardens are permanently fixed in the mind.

There is a daily companionship with living and growing things that express power and vitality. The companionship with a plant, as with a bird or an insect, means more than the feeling for the plant itself. Impressions made react on the individual. The forces of nature impinge upon the child from every side, and he responds at once to their touch. Animal, plant, mineral, river, sunbeam, mountain, physical and chemical change, are all matters of equal and absorbing interest to him, and if left to himself, he will, as a rule, inquire as freely about one as the other. It is through natural science that we find direct means of introducing the child to its earthly habitation. The principal life and happiness of an individual is dependent upon his knowledge of the things about him, his knowledge of their relations to each other and himself. Concepts must come through actual contact with the things, through the medium of the senses. Children deal principally with the concrete.

It is a pleasure to note that the pedagogical forces are taking hold of this field of instruction, so that now there are many school grounds enlivened by forestry, floriculture and garden adornment. I need not go into detail as to implement equipment, size, location, etc., for the garden. Begin the work, and needs will suggest what to provide, and the equipment will follow. It is not the main object

of a school garden to have the boys work as apprentices to the gardener's craft, although they may later follow it for a livelihood.

Prof. W. M. Hays: A year ago I began to do a little experimenting with rural school gardens, trying to arrange them on a simple plan of nature study, but to include some of the practical things of value in the garden. This is not so easily carried out. These plans have been tried in various school gardens with varying success. There has been one planted in this city, at the Horace Mann school, which is one of the more successful ones. Something can be done in this way, but we want to come to the understanding that our schools shall take up this work for themselves, and in that way get the teachers and children in the habit of using them. The problem is not a problem for the teacher of the school room alone. It is a problem coming up in many peculiar ways. It so happened that last winter I was interested in getting some legislation through the legislature. At the last moment a bill was passed appropriating $2,000 for the purpose of introducing agriculture in our schools. The bill contemplated the making of experiments in certain schools, and I was named as chairman of the committee to formulate plans to work this out. I believe something will come out of it, but it is more difficult than we had supposed. It is the opinion of the committee that this money cannot be better expended, at least a part of it, than in providing libraries for teachers from which they can get some definite information on certain subjects, and then by using charts that can be hung on the wall, comparatively cheap charts. The state superintendent concurs in this plan, so that the teacher can get her information from her own text books and use these charts for illustrating and explaining to the pupils in their experiments and observations. If the course outlined is followed, the teacher can tell the pupils a number of interesting things, can show them some things their eyes have not seen, and by means of these charts can induce them to bring these things into the class room, and in this way carry on practical instruction. She can not only interest them in the wild things that will appeal to them, but she can include also the practical things of the field, the garden and the orchard, and the dining room and living room. This is an undertaking that is generally considered wise. I feel certain that most of our teachers in the schools find these practical things are not so remote in the knowledge of the country boy and girl as is the fact to the city children whether a certain seed is wheat or barley. These little things about nature had better be taught in the city, but when we come to the country children I have come to believe that we are to carry them a new insight of things that can be done, teach them a little something of what it means to get into the better way of doing things. These ideas are not so remote from them. They will get more out of them than is represented by the mere labor.

We have a peculiar situation in Minnesota because of our school of agriculture. That as a type of school has proven the most successful type for building up of farm life of any school in the world—and I speak advisedly, for I have visited a great many schools in

Europe and America—because there is no secondary school in the country or in any country that has done so much to build up a school system upon such a type, a type which I hope will multiply in great numbers.

In some respects the problem is much easier in teaching these practical things in city schools than in country schools. There is better organization, but we are attempting to organize country schools. I believe consolidation will help to solve the problem in our country schools. Consolidation may mean too much the taking of the country school into the village and making an academic high school of it.

Now just a word in regard to the subjects to be taken into the country school. I will only suggest these matters for you to consider. Suppose Prof. Green and the entomologist and Miss Shepherd, the teacher of cooking, were to prepare such a paper, for instance, on the subject of the apple. Prof. Green could tell all about its origin, the planting, the grafting and its care; the entomologist could tell how to get rid of the insects that prey upon it, and Miss Shepherd could tell some valuable things about cooking the apple. These things are not so remote from the country children as we might think, and you would be surprised to know what some of our pupils could teach in the last year of the college course. Another subject that might be taken up is flowers, and something about crossing wheat, the growing of wheat, the rotation of crops, and Prof. Snyder could take them through the milling process, Miss Shepherd could take them through the cooking process, and in this way a very interesting little booklet could be made for the teacher.

The problem is with the teacher. How are we going to interest them? It looks now as though the main effort should be made through the county institutes. I have talked from the standpoint that suggested itself to this committee, and this committee and the dean of agriculture are open to your suggestions.

Mr. O. M. Lord: The remarks of Prof. Hays brought to my mind an object lesson that occurred to me last season. While the fruit was ripe, the plums, apples, grapes and other fruit, I had a couple of visitors from Chicago, three or four of them. Among them were two very bright, active, intelligent girls of about twelve years of age. I will not attempt to describe the delight and the remarks of those children in viewing the grounds about my premises. Neither of them had ever seen an apple growing upon a tree, a grape upon a vine or a plum upon a tree. They had tasted those fruits in Chicago, but had never seen them growing, and had not the least idea how they grew, and it was an object lesson to me I never expect to see repeated in this country. It was impressed upon me what a deplorable condition exists in the education of a good many of our city children, and it impressed me also with the value of the teaching in our agricultural schools where they come in contact all the time with the practical applications of this knowledge.

Mrs. M. M. Barnard: I was especially interested in Prof. Hays' remarks in regard to the agricultural school, for I feel deeply interested in that, and I have been especially interested in school gardens, and I only wish that such a garden as Prof. Hays' model

garden might be placed in every school in the cities and country both. There is just one problem that has troubled us in town in regard to school gardens, and that has been the lack of room. I have known of some instances where children have taken the greatest interest in planting a school garden, showing great skill in their work, and those children have been punished because they stepped on a flower bed. So I think if in our towns we could have more room to overcome that difficulty it would help to solve the problem.

Dr. F. M. Powell (Iowa): Just a word or two in reply to the lady that has just spoken. Where the teacher has a right conception of what a garden should be, it is remarkable what they will do. I think the kindergarten work cannot accomplish it all, but it is remarkable what they do accomplish by taking that small bit of ground, fertilizing it, shaking up the ground and doing their little planting. I recognize the embarrassment the lady spoke of, but a beginning will have to be made in some way until the people know the value of such instruction, and after that there will be no trouble. If parents once understood the importance of the work, or that it is of enough importance, they would provide the ground. The pioneers will have to work it out under, perhaps, rather embarrassing circumstances. This little border I spoke of, it is remarkable what that has done. It has been there for seven years now. I simply mention this as a successful way, and almost any teacher can find some little corner to make this start.

Prof. Hays: We have found out a few things in regard to these little gardens. It is better as a rule not to use too much land. A space of two rods square is ample. Six feet square will do nicely if it is well prepared. The more important suggestion is this: Do not try to have the work done right off. If necessary fertilize the land; haul manure on if the land is poor. Take away all the sod and get the land in nice shape and make it succeed, so that the crops will be an encouragement to the pupils. The great trouble is to get some one to stay by it and look after it.

Windbreak for Orchards.—"A windbreak is anything which breaks the force of the wind. In many cases an orchard may be sheltered by placing it on the leeward side of a hill. But there may be many good reasons for planting an orchard in an exposed site, so that it becomes an important point to afford it protection from trying winds.

"A windbreak is always desirable whenever the orchard is exposed to the full sweep of strong, dry or very cold winds. If the orchard is habitually exposed to strong winds, which break down the branches, blow off the fruit and make it disagreeable to work in, it should have a windbreak. If an orchard is exposed to drying winds, which not only suck up precious moisture from the soil, but also increase evaporation from the trees, thus increasing the danger of injury from cold in the winter; then, also, a windbreak is a profitable investment."—Professor S. W. Fletcher.

PLANTING AND CULTIVATION OF THE APPLE, PLUM, AND CHERRY.

A. W. KEAYS, ELK RIVER.

(Read before the Horticultural Club of Constance, Anoka County, Minnesota.)

For an orchard I would select good, rich soil, where I would plant my garden. Plant the trees not closer than sixteen feet apart. I should plant the rows twenty-five feet apart. The rows would be better to run north and south; they would protect each other from the sun.

I dig off a foot of the top soil, making my hole three or four feet across and two feet deep. I throw away the bottom soil, using only top soil to set my trees. Put in a little top soil, and lean your tree a little to the southwest, and the sun will not strike them so fairly and cause sunscald, and our hardest winds come from the southwest, which will make them lean in the opposite direction. I always set my apple trees ten inches deeper than they grew in the nursery, if the soil is not too low, and plums and cherries three inches deeper. I like a short body for the trees; two or three feet is best; the trees do better in this part of the state with the limbs low down.

Leave six or eight inches of the hole that you do not fill up. It will hold the rains in the summer and make the trees root down deep; in the fall fill up the hole before it freezes and bank up the trees a foot higher than the level of the surrounding ground. This will protect the trees from mice in the winter, and the water must not stand around the body of the tree; it might freeze and crack the bark. Be careful and straighten out the roots nicely, and cover them with some fine soil; then press the dirt down carefully and firmly all around the tree, leaving the soil loose on top. Stir the soil around the trees every week with a garden rake and hoe and do not let weeds and grass grow near the trees—it is poison to the trees.

I grow all my garden in rows among my trees, and cultivate with a horse. Do not grow corn near your trees, it saps the ground too much. You can plow the land in the spring, using one horse near the trees. I cover the land with fine dressing late in the fall, which puts it in fine condition for the garden in the spring.

When the trees begin to bear give them a liberal supply of dressing; they require it to bring their large crops of fruit to maturity. The fruit will be much larger. Wood ashes is a good fertilizer to spread around the trees in the summer when the fruit is small.

The following spring after you have planted your trees remove the dirt you put in the holes in the fall, so they will hold the rains the following summer. The orchard must have good, clean cultivation, and you will find that your trees will make a fine growth each year and you will make fruit growing a success. What would you say of the man that would plant a field of corn and never cultivate it during the summer, but let it grow up to weeds? He could not expect as good a crop of corn as if he gave it good cultivation. Give your fruit trees good corn cultivation, and you will be surprised how they will grow and how quickly they will give you good crops of apples, plums and cherries.

When you are planting do not forget to plant a few evergreens; mix them in among your fruit trees; they will be a protection to the trees. Put a few in the front yard, and a row around the buildings, and in years to come you will never regret it.

John P. Ness: Is the apple tree borer destructive here?

A. W. Keays: The flat headed apple tree borer scarcely ever does any damage in this part of Minnesota, but during the past summer they have been quite numerous in this section, the only time I have seen them for several years. The trees should be examined just at the ground. They work under the bark, leaving dark lines. You will find borings which look like sawdust around the bottom of the tree. Dig out those dark lines with a small penknife, and you will probably find the borer. If it has eaten deep into the wood use a small soft wire and you will soon punch and destroy it. I killed a large number the past summer when they were small and before they had done any damage to the trees.

Question: What are the best plums for this section?

A. W. Keays: The four best plums we have fruited to cover the season, and are healthy, hardy, productive, large and of good quality, are Akin, Cheney, Gray and Wyant. We have sixty varieties on trial, but several have not fruited yet, and we will perhaps have to change the list.

Question: Is it a good plan to mulch our apple trees through the summer?

A. W. Keays: I have tried this plan and think it is a bad plan. I find it brings the small fibrous roots to the surface, and our severe winters will certainly injure the roots. I prefer clean, shallow cultivation. My trees do best under this treatment and have not been injured by the hard winters.

AN APPLE GROWING EXPERIENCE IN KANDIYOHI COUNTY.

(Extracts from a letter from C. H. Engen, Norway Lake.)

"In the spring of 1888 I planted one hundred Wealthy trees, of which twenty-six died, fourteen are sick, and the other sixty are very healthy. The death of these trees was caused by mice and rabbits. The same year I planted twelve Haas; ten died of sunscald, while the other two are barely living. I also had six Longfield, of which four died, caused by mice and sunscald. Twelve Okabena, all are dead; eighteen Thompson Seedling, only four are living; six Patten Greening, all died; six Malinda, only one living; six Hibernal, all died. I am certain of the fact that most of them died because I did not take good care of them and did not protect them from mice and rabbits. Haas, Okabena, Thompson Seedling and Malinda apple trees—I do not believe they will do well for us here.

"The same year I planted the following named crabs: Twelve Minnesota, seventy-five Whitney, six Martha, six Virginia, eight Early Strawberry. All the above named trees have shown themselves to be good trees, as there has only died eight Whitneys, and all the others are healthy.

"I suppose you would like to know of my experience with apple trees. I began in 1870 with six dozen trees. At that time I thought that the best place for fruit trees was the warmest place I had on my farm, and therefore I planted them there. The next thing I did was that I wanted trees with a high crown. The trees were Transcendent, Hyslop and Duchess, but most of them died of sunscald. I had better luck with the crabs, and I have nine Transcendent, and although they have blighted some they have yielded from six to twelve bushels a year. The Hyslop and Duchess are dead. I have since that time planted a few trees each spring, and I have now about four hundred trees, of which about two hundred and fifty last fall bore fruit. I got one hundred and twenty bushels of crabs, one hundred and sixty bushels Wealthy, ten bushels Duchess and ten bushels of different kinds.

"I have not had very good luck with Duchess of Oldenberg, as they have a high crown and are liable to sunscald. The best trees I have are Wealthys, with branches about a foot or a foot and a half from the ground.

"The soil here is a black loam, one to two feet deep, with a clay subsoil which is very hard.

"I have had the experience that it is best to cut off a tap-root which grows straight down and is too tough to bend; but if a tree has branching roots, then I consider it a good tree.

"I believe that the soil here heaves in winter and tears the roots apart; but this is not so when there is a sandy subsoil.

"I do not believe that I have lost a single tree from drouth after it has stood a year; but the principal things we have to fight here are mice, jack-rabbits and sunscald.

"We have in this county mostly Scandinavians, and they have had very little experience here, but want to plant trees the same way as they did in the old country, which will not do well in this climate. Another drawback to more extensive planting is that so many people are fooled by buying stock from Eastern nurseries. I believe that there are many good places for orchards in this county, and that success is sure to come as soon as they get the theories from the old country out of their heads.

"I got a man named C. J. Rustad to plant his trees on the north slope, north of the woods. His trees are doing remarkably well, and he has not been bothered by mice, rabbits or sunscald."

SETTING TREES FOR WINDBREAK AND FRUIT.

A. A. DAY, FARMINGTON.

In the year 1861 I planted a lot of black locust seeds for a beginning, and set them out on this farm in the spring of 1864, while I was home on furlough from the war. It was the biggest fool trick I ever did. They have been a nuisance and a thorn in the flesh very frequently ever since. No! do not set out a locust.

The spring of 1866 I began setting a windbreak and fruit trees. I set first white willows around eight acres for a building place, fruit, etc. Inside of the willows I set cottonwood, soft maples, elms, box elder ash, lombardy poplars, cherry trees and others. Then I set white willow on three sides of 100 acres and used them for fence some years; but they took too much land, and we have been making wood of them and other trees we did not want for twenty years. They have furnished a large share of our fuel for fifteen or twenty years. If I was to commence again, on a new prairie farm, I would set for windbreak white willow, elm, maple, white ash and cherry, and mix in evergreens. The cottonwood is too large; they are in the way. The box elder seeds too much.

I have now standing about fifty large cottonwoods, twenty-five to thirty inches in diameter (some of them); fifty soft maples, nearly as large but not as high, and many smaller ones; fifteen or twenty elms, not as large but large enough. I have 100 or more box elders. This variety does not grow so large, but it scatters seed all over the farm. One can be digging box elder roots all the time and not get them all. I planted the seed and raised a few black walnuts and

white walnuts; they are not real hardy, but have fruited many years. I have one bitternut tree—we used to call it pig hickory east—I set out in an early day, and it is strong and healthy. I think it would do to mix in for windbreak.

Within this windbreak I set an orchard of over 300 apple trees. I presume I set near a thousand in all. As they died out I filled in and kept it full, until about fifteen years ago I began to neglect my orchard and went south for my health.

I noticed in the discussions last winter there was an apparent disposition with some to reject everything that had not done well with them. My brother Levi's farm joins me on the west, and brother Ditus' is one mile west and one-half mile south. I would like to show you the difference in the three orchards. My orchard has a gentle incline both south and north; Levi's is level; Ditus' slopes to the south. The same variety of apple trees does not do as well with me as with either of my brothers. For example: I have tried to grow the Orange crab, but they all die before or soon after fruiting. Ditus has had them in abundance for the last fifteen or twenty years. Levi's do better than mine. With some other varieties it is the same; they have stayed and done reasonably well with Ditus, and have been dead and gone for many years from my orchard. My soil is blue clay for forty feet before reaching sand or sand rock, Levi's is clay of different depths, with sand veins or more or less sand drainage; Ditus' is deeper soil with more or less sand veins, etc., etc.

FRUIT AT THE PAN-AMERICAN EXPOSITION.

JAS. MCMILLAN, SUPT.

I was in charge of the fruit exhibit of Minnesota at the Pan-American. I want to say to you that Minnesota was "in it" in more ways than one. It was in it in butter and in fruit. We took the majority of medals. When we consider that Minnesota was known but little in the east as a fruit-growing state, and when we consider on the other hand that Minnesota put up the best fruit exhibit at the Pan-American, which statement is justified by the gold medal we received, the people in the east think more of Minnesota than they did some time ago. Our fruit exhibit was a revelation to them, and I want to say this, that I could have taken orders for two hundred and fifty carloads of Wealthy apples. That may seem a strong statement, but I was not in the commission business, neither did I think I could procure that number of carloads, yet I think it was safe to say I could have taken orders for two hundred and fifty carloads. The Minnesota fruit was a surprise to all. The Wealthy

apple is not only propagated in our own country, but in other countries, and I think the highest compliment that could be paid our society was tendered one day when the exposition officials were invited to Toronto to meet the Duke and Duchess of York. On the way over one of the Canadian officials called my attention to an orchard growing on the Canadian side and said that four-fifths of the trees were Wealthy. That speaks well for Minnesota. Our apples and our grapes as a whole produced more of a sensation at the Pan-American than the product of any other state. Had we started in a little earlier we would have taken the Wilder medal for varieties, but as it was it went to Oregon. Many other states had magnificent exhibits, but there were not many apples. Mr. Van Deman himself told me in comparison all the way through there was nothing that could come up to Minnesota fruit in flavor and quality. I was very much surprised almost every day to have people meet me on the grounds and ask if there was not a possibility of getting just a little basket of those Minnesota apples. That speaks volumes for us.

I thought it might be of interest to you, gentlemen, to know how our state was regarded as to its fruit, and I thought it was my duty to come here and tell you what Minnesota has done in that direction. We are the only state that took the gold medal on fruit, so Minnesota has done a great thing for her advancement at the Pan-American.

Medals awarded on Minnesota fruit at the Pan-American Exposition:

1 Gold Medal—Display of fruit.

2 Silver Medals—Display of apples and grapes.

6 Bronze Medals—Display of apples and plums; display of grapes; display of apples; display of Wealthy apples; display of apples and grapes; display of apples and grapes.

8 Honorable Mentions—Display Wealthy apples; display Weaver plums; display apples; display apples; display apples; display Concord grapes; display Duchess grapes; display Delaware grapes.

BIOGRAPHY OF J. S. B. THOMPSON.

On the 30th of May last passed one of the pioneer fruit growers of the West, in the person of J. S. B. Thompson, for many years a resident of Grundy Center, Iowa, where now his remains lie buried. Mr. Thompson is known in this region as the originator of the Thompson Seedlings, though it is probable that this honor should be equally divided with his wife, as she procured on a visit to her father's home in New York in 1861 the seeds from which the orchard was grown. Her father owned a valuable seedling orchard, and it was seed from selected fruit from this orchard that was afterward planted in Iowa with such notable results.

J. S. B. THOMPSON.

During the first few years of the growth of these trees Mr. Thompson was serving his country in the First Iowa Cavalry, from 1862 to 1865. The year following his return home the most valuable of these trees were transplanted to the site where they now stand, many of them being fifteen inches and upwards in diameter. These trees have been very generally planted in this state, and it will not be necessary to refer to them specifically by name.

Mr. Thompson at the time of his death was seventy-four years of age, having been born in Madison county, New York, in 1828. The year 1860 found him a resident of the state of Iowa, after having lived a few years en route in Illinois. His life was passed as a

farmer and pioneer fruit grower in the state of his adoption. At the time of his death he was in Oregon, having purchased a farm there two years previous, drawn there doubtless by his interest in fruit growing and his desire to exploit it in a more favorable field. He is survived by his wife and several children.

GROWING THE APPLE IN THE RED RIVER VALLEY.

A. W. LATHAM, SEC'Y.

The last ten days in June this year I spent with the Farmers' Institute Corps, visiting various points in the Red River Valley not over fifty miles distant from Crookston. On the way there I stopped over a day at Fargo and visited the North Dakota Experiment Station, the horticultural department of which is under the charge of Prof. C. B. Waldron. As this article is to deal specially with apple trees in the region referred to I will not speak of other matters except in a general way to say that small fruits of most kinds succeed fairly well in the Red River Valley except where alkali is found, though of course they need a little more winter protection than at points farther south.

At Fargo I found no apple trees of any size, a few a short time planted and showing the effects of a rigorous climate. Judging by my observations there, I was hopeful that at Crookston and at points farther down the valley I might find some varieties of crabs, and was not at all prepared for what I did find.

The initial efforts at apple growing at the Crookston State Experiment Station, of which Mr. T. A. Hoverstad is superintendent, have so far not been very successful, owing, in my judgment, principally to two causes inherent in the existing situation, too much alkali in the soil and too little protection from the fierce winds of that level and open prairie country. These obstacles can and are being met, the first by selecting locations on the farm that use shows contain a minimum of alkali, and the second by the rapid growth of the effective windbreaks that are being grown on the north and west sides of the Station property, as a part of the general experiment work. The introduction of seedling native plums as a feature of these windbreaks is a somewhat novel idea which it would be well for other prairie planters to copy. It is delightful to come across them here and there in the groves, well laden with fruit; and they appear to thrive well in contact with other young growing trees, even though considerably shaded.

The most northerly point visited was Argyle, a small town fifty miles north of Crookston, and about the same distance from the Manitoba line. On the places of H. L. Melgaard and his brother there I found some very healthy apple trees, planted some six years and generally bearing fruit, of the Hibernal, Charlamoff, Duchess, Wealthy and Ostrekoff varieties; and also Patten's Greening, Anisim, and University, which had not fruited as yet. There were also trees in bearing of the De Soto, Forest Garden, Wyant and Aitkin plums. On these grounds also were a large variety of ornamental shrubs, roses, etc. The apple trees were not struggling for existence, but were healthy and vigorous. The Red River Valley, as our readers must know, is a level plain, without timber, except a thin fringe along the banks of the streams that run into the Red River, and usually a very good belt of timber along the Red River itself.

The places referred to at Argyle were fairly well protected from winds in all directions, though there was nothing like any formal windbreak or close protection around them. But incidentally, being in the village, there were many trees and buildings that broke the force of the winds.

At Halstead, about forty miles south of Crookston, on the open, flat prairie, I found a most interesting orchard on the place of Rev. O. A. Th. Solem, an old resident of the valley, and for many years a member of this society. Without being able to state exactly, I judge there were from seventy-five to 100 trees in his orchard, the oldest having been planted about ten years. They were Hibernal, Patten's Greening, Duchess, Arctic, and a number of varieties of crabs. The oldest of these trees had attained a normal size for their age, and were very healthy and vigorous trees, not fruiting very much, as I saw them, but, I understand, had borne a good crop the year preceding. Trees a little younger of a number of other varieties of apples were doing well and promised practical results. This orchard is exceptionally unfavorably situated, it would seem, as it is entirely open to the north for a long distance, a mile or more, at least, and devoid of any kind of protection, giving a tremendous sweep of wind in that flat country. But it is unusually well protected on the south by a row of deciduous trees near by, and a few rods away by other rows of deciduous trees interspersed with evergreens, making a very close windbreak at that distance. In this article I am not making special reference to crab apples, though many varieties of these were found at all the points referred to, my purpose being to show the condition of the pyrus malus, the common apple, found growing in this northern region.

At St. Hilaire, a town on the banks of the Red Lake River (and probably it would be proper to speak of this as being outside the Red River Valley, as the country there is no longer a continuous dead level, although it is situated only some thirty miles from Crookston), I found a very interesting orchard of eight or ten years' planting, covering in an open way two or three acres. The varieties grown here were practically the same as those heretofore referred to, both of apples and plums, and there were also plenty of small fruits, and quite a nice vineyard of Concord grapes, which I

BEARING APPLE TREE, ON FARM OF JULIUS PLETH,
St. Hilaire, Red Lake County, Minn.

was informed usually ripen there. These trees stand on what seemed to the writer a southwest slope. They are fairly well protected in all directions by timber sufficient for the purpose of a windbreak, and the trees were healthy and vigorous, as well as hardy. Some were fruiting, but not very much this year. They have, however, borne well in previous years, I was informed. What was a great surprise to me there was a small orchard in the midst of dense woods, perhaps a third of an acre, full of apple trees from ten to twelve feet high, making a very vigorous growth indeed. Amongst them was the Tetofsky, looking healthier than I remember to have seen it in this region in many years.

The most important find in the way of mature fruit trees was in Crookston itself, on a steep northeast slope of the bank of the Red Lake River, flowing through the heart of town, on the place of a Mr. B. Sampson. There were a number of apple trees growing on this place, of varieties with which neither Mr. Hoverstad, in whose company I visited this orchard, nor myself were familiar, and hence probably not as hardy as the varieties previously named. These trees seemed to be very hardy, and some of them I might say were entirely so, although they were not large for their age, and Mr.

A VIEW IN ORCHARD OF MR. BERNARD SAMPSON, IN CITY OF CROOKSTON.

Sampson informed us they had been planted there more than twenty years. In common with other apple trees of the valley they were not bearing much fruit this year, but in previous years had been usually productive.

The presence of these healthy apple trees at these different points in the valley, and of varying ages, growing under what seemed quite different circumstances, would seem to point with considerable certainty to the probability of successful apple tree culture in that region under certain conditions. Besides these special instances noted, the writer saw many other healthy trees, mostly younger, however, and not so especially notable. While the locations of these orchards are in many respects radically different, there were common conditions that seemed to hold vital relation to their

success in that severe latitude. In each case there was a sufficient protection on the south side of the orchard. In at least one case there was none whatever on the north, and in other cases the north and west protection was an indifferent one, but in each case there

A TWENTY-YEAR OLD APPLE TREE IN ORCHARD OF MR. BERNARD SAMPSON, CROOKSTON, MINN.

was this south protection, and generally also on the west. It seems to the writer that this is a very important point in connection with fruit growing in that region, and indeed, from the opportunities of observation that have come to me, I judge, in all parts of the state. A good protection on the south and southwest from the drying

winds of both summer and winter appears to be a most necessary prerequisite for the successful culture of the apple in this climate.

There is much to be said along this line, but it may be out of place in this article, which is only intended to describe what is doing in apple culture in a region generally thought to be most unfavorably situated for this industry. It was certainly a great surprise to the writer to find there such unexpected and favorable results. It must not be inferred from the encouraging facts noted above that the future of apple growing in the region referred to is assured. Far from it! Those who plant this fruit there must do it with caution and be prepared for probable failure, at least until the conditions are more fully studied, understood and applied. But the outlook is certainly hopeful and the probabilities of success strong enough to warrant the most persistent and careful effort. In the meantime if the reader is interested in this work, let him not fail to become and continue a member of the Minnesota State Horticultural Society and get the great advantage of the experience and counsel of its large and practical membership, who are all in a sense also experimenters.

LESSON FROM MINNESOTA FRUIT EXHIBITS.

OLIVER GIBBS, MINNEAPOLIS.

I have analyzed the report of the fruit exhibit at the Minnesota State Fair of 1901, as given in the October Horticulturist, and find some interesting facts and figures, which are herewith furnished, together with a comparison or two with former records:

State Fair Fruit Exhibits, 1901—

Nurserymen exhibiting	10	
Farmers and amateurs exhibiting	44	
Total number of exhibitors	54	
Number of named varieties of apples	290	
Number of named varieties of crabs and hybrids	41	
		331
Number of named varieties of native plums	91	
Number of named varieties of domestica and Japan plums	21	
Percentage of crabs and hybrids to all apples, about	12½	
Number of plates of fruit—		
Apples, including crabs and hybrids	2,364	
Plums	515	
Grapes	454	
Peaches and pears	15	
		3,348

not find a list of the varieties of grapes exhibited.

To show the progress of fruit culture in Minnesota, as indicated by exhibits at fairs and expositions, I have little data at hand, but will give you what I have.

At the annual meeting of the State Horticultural Society in December last, there were thirty-two exhibitors, of whom six were nurserymen and twenty-six were farmers and amateurs. They were awarded premiums on fifty varieties of named apples and fourteen of crabs and hybrids; the total number of plates being about 1,000, of which a large number were unnamed seedlings.

Now, having in mind the state fair figures, that being a September exhibit:

September 12, 1883, when we won the Wilder medal of the American Pomological Society, at Philadelphia, for the best exhibit of apples and grapes for all North America, we showed only 140 varieties of apples, forty-eight of which, or a little over thirty-four per cent, were crabs and hybrids, and thirty varieties of grapes. This exhibit was all collected after the 12th of August. With two weeks more time we might have gotten together perhaps two hundred varieties of apples in all; but taking the number as it was, the advance from 140 varieties in 1883 to 331 in 1901 is, to say the least, encouraging, and the reduction of percentages of crabs and hybrids to apples from 34 per cent in 1883 to 12½ in 1901, is certainly remarkable as showing the present confidence of our people that they do not have to restrict their apple growing to the undersized crabs. The smaller percentage of crabs and hybrids grown is due to the fact that the growers have of late planted the best varieties of them from choice, to get a certain desirable crab quality which they want for home use and for which the market has increasing demands.

Right here we will take a glance at one more back number: At the New Orleans Exposition in 1884-5, although we had only about one hundred varieties of apples that we could show in the winter we massed about 200 bushels, 100 bushels being very fine specimens of our Wealthy,—sixty bushels being always in sight at one view. But so little was generally known, even among our own people, of what our state was growing then, that a party of railroad men living in St. Paul and Minneapolis, headed by one of the general passenger agents, said to me, with his finger laid to his nose: "This is a grand exhibit, but of course we know these apples were never grown in Minnesota," whereas they were not only all grown in the state, but the most of them within twenty-five miles of his office.

I have found in the rooms of the State Historical Society at St. Paul a photograph of the Minnesota fruit exhibit at New Orleans, taken about a month earlier than the one reproduced in a previous report, together with a lot of partial views of the same which come into view in photographs of other departments of the state collective exhibit; and through the courtesy of the executive board of that society was enabled to secure their transfer to the Minnesota State Horticultural Society.

(The photograph of the New Orleans fruit exhibit from this state, referred to above, is reproduced as frontispiece in this number.—Sec'y.)

The tall figure in the center is a plate glass colored transparency representing both sides of the Wilder medal of 1883. The whole exhibit was 9x36 feet in area. The light colored space at the right end was where Mr. Gould's beautiful little cranberry marsh in natural growth and fruitage was put in a few days after the photo was taken.

ÆSTHETIC EDUCATION.

PRES. W. W. PENDERGAST, HUTCHINSON.

(A talk.)

There is no tax so heavy in this state and in all of the northern states of the country as the tax for education. There is no tax that is paid so willingly as that tax. Now to make this money go the farthest, to make it of the most value, it is absolutely necessary that we know just exactly what we want to do. We talk a great deal about methods in education. Methods of what? Before we make them full methods, before we go far, we must learn what these methods are capable of doing. The prevalent idea has been for thousands of years that education is an accumulation of facts, I may say useful facts, useful information. It seems to me that this is all a heresy. We need some facts as the foundation for the superstructure which we are about to build, but education itself is a growth, and it is a growth along three different lines, the physical, the intellectual and the moral and æsthetic. As we are impressed with things that happen about us we grow. If the impression is a good one it causes growth; it leads us to a higher plane. We constantly go up to a higher plateau, and none of these different things must be neglected, the physical, the intellectual and the moral and æsthetic.

I am now going to speak about the moral and æsthetic. If we send our children to school, and the surroundings are all pleasant and beautiful, their lives will grow to something better and higher.

If the grounds about the school house are in a wretched condition, an eyesore to the passer-by, the tendency will be to drag them downward to the level of their surroundings, just exactly as it is in our attempts with improvement in fruit. We must keep struggling to get up to something better. We must have an ideal of something better we want. That thousand dollar prize gives us an idea of what we want in the apple line, and we must strive to have that; that must be the result of our effort. So in our schools we must have a high ideal. We must see the beauty, we must see it in our surroundings, we must see it in the character of the teacher, and then it will be seen in the character and behavior of the pupils of the school. That is just all it is, just the thought I want to throw out. Education is a growth and not an accumulation of facts, growing stronger every way, and by and by we shall come just as near to the limit as possible. That painter, you know, who painted the boy, the most beautiful object he had ever seen, he painted his picture because he came nearer his idea of angelic perfection than anything he ever saw, thirty years afterward picked up out of the gutter a wretched drunkard and took him to his room to paint his portrait as a companion picture of the other, because he was in the other extreme; and when he got through he asked the name of the man, and, behold, it was the same name as that of the little four year old whom he had found thirty years before in that pleasant little country home. Now there is a limit to the height we can reach. Some say there is absolutely no limit. We are human, we cannot go up to God in this world. On the other hand, there is a limit to the depth to which we may sink. We may never, though we do our worst, we never can get quite down to perdition in this world. But those two points are a vast distance apart, and it should be our part in our schools to bring every one who enters our schools as nearly as possible to the highest point obtainable. (Applause.)

When Blight Strikes.—"In watching our orchard I have noticed that our Tran. and other varieties of crab are always struck by blight during those heavy electric storms of thunder and lightning. I have noticed this to be true in other seasons, when we have had heavy electric storms."—C. L Blair, St. Charles.

Secretary's Corner.

A WORD FROM A VETERAN.—"In spite of young tornadoes I am harvesting a quarter crop of apples. My hybrid, the Dartt, as you call it, is pleasing me; trees well loaded, quality fine. Its greatest fault is size — too large as a crab and too small as an apple." E. H. S. DARTT.

A SUCCESSFUL FRUIT GARDEN.—"We are having a splendid crop of fruit this year. Strawberries have a big crop. The product from one-third acre sold for $165.00. Duchess and early varieties are selling for $1.25 per bushel." There are many other such.

THE AUGUST NUMBER WAS VERY LATE.—A series of untoward events connected with the mechanical part of the work of publishing our monthly were to blame for the very late issue of the August number. Once in a while "a cog slips" in the best geared machinery.

A SUCCESSFUL SEASON.—The Minnetonka Fruit Growers' Association, representing the north shore of Lake Minnetonka, have made sales of fruit this season in excess of $43,000. The crops of its members have been good and prices high. The fruit growers in that region are happy.

"THE SHELTER BELT IS NECESSARY."—These are the concluding words of a recent letter from Seth. H. Kenney, of Morristown, hin wich he describes the devastation in his orchard from wind storms this summer. There are other reasons why a shelter belt on the side of the orchard from which the wind storms come is a good thing. Think about it. Next spring is a good time to plant one.

MAGAZINE OF ARBORICULTURE.—This is the title of a new Magazine devoted to the general subject of tree culture,to be published by the International Society of Arboriculture,of which General Wm. J. Palmer, of Colorado Springs, Col., is president and John P. Brown, of Connersville, Ind , is secretary. The initial number will be issued September 1st. The subscription price, (including membership in the society) $2.00, may be remitted to the secretary.

PROF. F. A. WAUGH GOES TO MASS.—Prof. Saml. T. Maynard, for these many years professor of horticulture at the Massachusetts Agricultural College, has severed his connection with that institution, and Prof. F. A. Waugh, of the Vermont Agriculture College, takes the place vacated. Both these names are very familiar to us as advanced thinkers and workers in this field. Prof. Maynard's plans are not announced. We understood that Wm. Stewart, heretofore assistant horticulturist in the Indiana school, takes Prof. Waugh's place in Vermont.

View of Horticultural Hall, Minnesota State Fair.
Taken Saturday, Sept. 6, 1902.

THE MINNESOTA HORTICULTURIST.

VOL. 30. OCTOBER, 1902. No. 10.

HORTICULTURE AT THE MINNESOTA STATE FAIR, 1902.

A. W. LATHAM, SEC'Y.

The display of fruit in this department was larger in quantity than that of last year, and also surpassed it in size of fruit and general appearance. When the character of the season is considered the results may be called extraordinary. The summer of 1902 will long be known for the severity and frequency of its storms, the effects of which are very marked, especially in the orchards. Very few orchards have escaped their devastations, and hail marks are common on most orchard fruits. Even fruit selected with great care for exhibition was in many cases too plainly marked from this cause. The lateness of the season also was another drawback. If the exhibit could have been made ten days later the show would have been much more brilliant in yellows and reds, which that much more time would have given to Minnesota apples. As it was, with the exception of the Duchess and a few other early varieties, the uniform tint was a crude green. Notwithstanding these meteorological drawbacks the show was a magnificent one, and received only compliments, and no criticisms.

The total number of plates of fruit shown in the hall was 3,761, divided as follows: apples, 300; plums, 295; grapes, 454; compass cherries, three; peaches, one, and pears, six. There were four exhibitors in the sweepstakes apple class, aggregating in all 250 plates, ranging from forty-one to seventy-five, the latter being the maximum number allowed. In the class of professional collections of apples, there were five exhibits, aggregating 290 plates, the highest number shown by any one competitor being ninety-one. In amateur apple collections there were seven exhibitors, aggregating 270 plates, ranging from eighty-three to thirteen. The grape exhibit this year was comparatively light on account of the lateness of the season, exhibitors disliking to show green fruit, and also because of the devastation by hail, which was quite general throughout the

grape growing region of Lake Minnetonka. The plum exhibit was also light, there being very few in the state. The exhibit was, however, much in excess of what was anticipated.

The principal professional apple exhibitor was F. I. Harris, son of the late J. S. Harris and owner of his fine experimental orchards. In the amateur class Wm. Oxford led with eighty-three varieties, many of them very fine specimens. The list of exhibitors was little changed from a year ago, though there were a few who stayed away on account of the unsatisfactory condition of their fruit. The William Somerville orchard, at Viola, has changed hands during the year, the exhibit being made this year by the present owner, J. W. Lufkin.

EXHIBIT OF ALASKA VEGETABLES.

The season was especially favorable for the Mycological Club, and their show of mushrooms was an object of great interest to the crowds who stood around their tables. Fifty dollars was divided amongst the members of the club who participated in the display.

The show of plants and flowers by the florists was equal to any exhibit they have ever made. This occupied the benches around the room, making the horticultural exhibit as a whole a bower of beauty.

There were three nursery exhibits in the hall, the Jewell Nursery Co. occupying the same space as last year with a striking design in which they used the same foundation as they did a year ago, surmounted by a tower veneered with apples inlaid with high bush cranberries. It was a beautiful conception and attracted at-

tention from every passer by. The other commercial exhibits were from the Minnetonka Nursery Co. and C. P. Nichols, of Northfield, occupying each a corner of the hall.

We were fortunate in having with us during most of the week three professors of horticulture; from our own state, Prof. S. B. Green; from North Dakota, Prof. C. B. Waldron; and from South Dakota, Prof N. E. Hansen. Professors Hansen and Green acted as judges of apples, assisted by others who were present. The list of awards following tells the story of the display in full.

On Thursday afternoon an assortment of garden vegetables was put on exhibition, sent from Skaguay, Alaska, by express, just a week before to a day. They came largely from the garden of A. H. Brackett, an old member of the Minn. State Horticultural Society, whose interest in the state of his birth seems not to have abated as a result of some years residence in Alaska. The cut accompanying shows the extent and nature of the exhibit. They attracted much attention, and some suspected they were really grown nearer home, but they came from Alaska as stated on the card pinned above it, just the same. Through the courtesy of the Great Northern Express Co., the exhibit was brought through in the shortest possible time and without expense in transit.

THE POSITION OF AN ECONOMIC ENTOMOLOGIST.

PROF. F. L. WASHBURN.

State Entomologist, St. Anthony Park.

Not long ago a friend of mine (an economic entomologist) in answer to my question, "What do you think is the most important point in the education of an economic entomologist?" replied, "The ability to put himself in the position of a farmer." It seems to me that he hit the nail squarely on the head. And it is one of the most important and one of the most difficult things in the work of an entomologist to be able to look at questions regarding insects which are devastating the crops or the orchard in the same light that the farmer does. It is this very point which explains the hesitancy of an agriculturist or a horticulturist in accepting the advice of an economic entomologist. They say, and with some reason, "Your advice is very good, but your knowledge has been attained either in the laboratory or from books or from casual study in the field. In giving advice you have nothing at stake in dollars and cents." Perhaps the orchardist and the farmer carry this criticism of an economic entomologist too far, because the entomologist of

today studies the economic side. The practical side is fully as important as to know simply what will kill an insect or check its ravages. If he does not know this he is an entomologist without being an economic entomologist. You might almost call him an extravagant entomologist instead of an economic entomologist.

There is too great a tendency on the part of the farmer, and to some extent, though not so much so, on the part of the orchardist, to depreciate the advice coming from an experiment station. They are too wont to say, "Oh, those chaps are full of book learning,"—at least that has been my experience in parts of the west. I believe, however, that in this locality that is a thing of the past, and the orchardist and the entomologist appreciate each other's position fully and learn from each other very much that is of mutual advantage. At the same time I will admit it is one of the hardest things in the world for an entomologist to put himself completely in the position of an orchardist or a farmer. I believe, however, that by a generous co-operation on the part of these two, excellent results may be obtained. Let the farmer cultivate books more, let the entomologist cultivate farm work more. To illustrate some of the difficulties which are to be overcome by careful study, I mention certain questions which all the time present themselves to the entomologist. A certain insect attacks the grain; what is it going to cost to treat the large tract of grain so as to eradicate the pest? Or, is the injury caused by the insect of sufficient consideration to warrant the expenditure of material and labor? Or, is not the attack a temporary one? Or, is not the remedy to be applied worse for the grain than the attacks of the insect?

The same question will apply in the case of the orchardist. Apples may be slightly attacked by some insect eating the surface (I do not refer to the codlin moth), or a few leaves early in the season may be slightly eaten or crumpled (I do not refer to the tent caterpillar) or may show evidence of being affected by some small mite. The orchardist, always solicitous for his crop, writes to the economic entomologist to know what to do, and it is a delicate question for the latter to decide just what to say. Whether to say, spray at once, or whether to say the injury is not sufficient to warrant special treatment, or whether to say the insects' attacks will soon cease and the tree will not be seriously affected.

The great difficulty of the entomologist, of ALL scientific men in fact—I will not say ALL but of a large number—is the desire to publish. This is a genuine weakness which must be overcome before we make the best progress. A desire to get out something new, to anticipate his fellow workers in the same field, urges many a scien-

tist to go off at half cock, to use a slang expression, after which he generally has plenty of time to repent of his rash utterances. The more I come in contact with the heavy men in science, the more I am impressed with the extreme care and the great patience that they show in going over a problem again and again before venturing to express an opinion. Like the fable of the youth searching for truth, they struggle onward, surmounting obstacle after obstacle, and the work ends with their only finding possibly part of the truth. Some of these problems are fascinating, the struggle itself is fascinating if taken up in the right spirit, and if he can by years of work add but a slight contribution to the world's sum of knowledge, he has achieved a signal victory.

Let us compare, if you will, the position of a scientist in an experiment station with one in a university; whether the scientist be a horticulturist, agriculturist or veterinarian or, what interests me much more, an entomologist. In the university a biologist, whose work may be said to approach that of the entomologist, can take up any problem which attracts him. If he pleases to study the development of the sturgeon, or the method of fertilization of some kinds of orchids, or the physiology of nerve muscle under certain conditions, he can follow out his bent to the full extent of his pleasure; but in the case of the economic entomologist problems of all kinds are fired at him. He cannot choose. He must study and conquer these problems of the day or to a certain extent fail in his work. It is not for him to say "I should like to spend my time studying the development of that larva, or the gradations in color of that butterfly or the metamorphosis of that beetle"; but serious problems representing, as you know, many thousands of dollars are all the time pushing themselves into his notice. For that reason it seems to me the position of an economic entomologist, with all the fascinating features which it offers, is a most important and a most difficult one, one requiring consideration from the orchardist and not criticism.

I note on your program that I am down to say something about strawberries. Strawberries are all right (with cream and sugar), and I always like to see a good crop. I hesitate, however, to take up a discussion of the numerous pests which attack the strawberry. I feel that this body of practical men and women have worked so much in the strawberries that what I might say would be like carrying coals to Newcastle. Furthermore, as you know, I am a newcomer in your state, and, while I lived some years ago in Minneapolis, I have for thirteen years been living on the Pacific coast,

and I do not propose, as intimated at the beginning of this talk, to speak hastily on any point nor to express my opinion, intending it to carry weight, until I have thoroughly studied the question presented. I might say, however, in a general way, that among the pests attacking the strawberry there are two which stand out with some prominence. One, the strawberry root borer, in its larval form is a pinkish caterpillar half an inch long which bores in the crown of large roots of the plant. In June about this time it changes to the pupa, and late in this month a small dark gray moth emerges, laying its eggs in July, in the crown of the plant. The plants wither and die as a result of the injury. A general remedy suggested is to dust the plant with air slaked lime or soot, but this is only a partial relief. The only way really is to take up the infested plant, burn it and plant a new one. Interesting to note in connection with this plant, though there is possibly a mistake in supposing it to be the more interesting, is the peach twig borer; for both are known under the same name *Anarsia lineatella*, and they resemble each other closely, but evidence is not lacking to show that they are not the same. Some interesting information along this line may shortly be expected from the California Experiment Station. By peach twig borer you will understand that I do not refer to the peach tree borer.

The second pest is the strawberry crown borer. This is a beetle that deposits its eggs in June and July on the crown. The larva, or grub, bores in the crown until it is full grown, one-fifth of an inch, white with a yellow head, transforming in the root. The beetle emerges in August. The beetle is brown, about one-sixth of an inch long. The best known remedy is to dig up and destroy the infested plants.

As to insects attacking and eating the leaves, I think I am safe in saying they may be killed by spraying the leaves (this must be done long before fruit is ripe) with Paris green or hellebore in water. As I write this the insect question suggests itself in connection with robins and other birds eating the fruit. It is trying to the strawberry grower to find that fruit which could be marketed has been practically destroyed by the birds. The question is what shall we do about it? Shall we shoot the birds as our enemies, or shall we cultivate them as our friends? One of the most interesting as well as one of the most difficult questions is this very point. My personal opinion is that if the birds nest in the vicinity of the garden they consume enough injurious insects when feeding their young (and, as you know, the number that they take to their young in a day is almost incredible) to more than pay for the fruit they con-

sume. The actual solution of this question is one which calls for at least a year, probably two years, of careful study upon the habits of one bird, because one season's conditions may cause the food habits of the bird to differ from its habits during the following season. The question as to whether beneficial insects are consumed, as well as the injurious forms, must also be considered. The actual market value of the fruit eaten is another point. Why cannot the horticulturist and the berry raiser become entomologists? Let me suggest that each one of you, not only because it is a question of dollars and cents to you, but because to any one who loves nature there is a certain aesthetic pleasure in it, make a study of these questions: What insects are friends? What are foes? Is that bird to be welcomed or to be destroyed?

UPS AND DOWNS OF STRAWBERRY CULTURE IN MINNESOTA.

WM. LYONS, MINNEAPOLIS.

I cannot tell why our secretary should honor me with a request to write a paper on this subject, when I have often told all I knew about strawberry culture, unless it was to show his respect for a pioneer strawberry grower, or he may have thought me too good natured to refuse a task that could hardly be imposed upon another at this busy season of the year, or perhaps he thought my wild theorizing might create a little wholesome discussion. But no matter what it was, I realize that in compliance with his request I assume a most difficult task, since everybody wants new ideas, new plans and new theories. Now this whole ground has been gone over time and again, each one telling the same old story and in the same way, but perhaps the new members coming into our horticultural family require just such instruction and advice as would be stale and uninteresting to the older members.

We horticulturists are always ready to give freely the information which costs us dearly.

In the part of Hennepin county that I have lived in for more than thirty years, all the berry growers that have continued to raise "Countess" and "Crescent" strawberries have succeeded, while all who depended on the new and larger varieties have failed. The only people who made money out of the new varieties were those who sold plants. This is my experience of the "ups and downs of strawberry growing" in my part of the country.

I drove through the strawberry region last spring for information, stopped at a great number of places and asked "What vari-

eties are you planting?" The answer was, "Countess and Crescent with a few Bederwood."

They grow their plants separately, but mix them in the basket. When planting they hardly ever have a failure, and sometimes very large crops. Only two days ago I was on the Minneapolis market, where I met several growers with loads of berries. One man had twenty crates of "Countess and Crescent." They sold for $2.00 per crate. Close by was another man with two crates of the largest berries on the market. He got $2.25 per crate. Each one had two acres in berries, and that was a fair test of how they were going to yield. Last season was hot and dry. "Countess" and "Crescent" made a full matted row, while the big varieties withered and dried up in the hot sun. Every one can see where the "ups and downs" are in this case.

Some ten years ago I prepared three acres of good land which had been well manured and planted to potatoes the year before. I ploughed eight inches deep and planted early in the spring. I set several varieties which had done well for two years before, but mostly the Bederwood, and gave them the best of culture all season. In the fall it looked the best of any bed I ever raised. The foliage was immense. I covered them with rye straw for the winter. Early in the spring they were all alive, but, alas! the Bederwood was struck with a rust or blight, and soon it spread to all the other varieties, and I lost my whole crop. There were two dead furrows the length of the field, and at the bottom of them I picked about one hundred quarts of small berries. I concluded that nature had taught me a lesson, that it was not necessary to go to so much expense to grow berries.

Had this field been planted to Countess and Crescent I would have sold several hundred dollars worth from it.

Strawberry experts tell us to plough deep and subsoil, and make the ground as mellow and loose as possible. That is all right if you want plants for sale, but all wrong if you want fruit.

Again they will tell you to cut off all the first runners until some time in August. Here in Minnesota it is generally always dry at that time, and no runners can catch. I save the first runners and cut off the last. I have tried a good many new varieties. While some proved extra fine, the majority were worthless on my soil. Those new varieties have caused me more failures than all the droughts and frosts put together, so I will try these high priced varieties very sparingly hereafter.

The Clyde is the only new berry I have tried in the last ten years that I find is worth growing. They have many defects, but some

of them can be overcome if given the right kind of treatment. Grown in matted rows some seasons they lack foliage to protect the berries from the hot sun. I have had them blistered and scalded until they were horrible looking things. Give them hill or hedge culture, and you will have rank, heavy foliage that will protect berries from sun and rain, and the berries will be firm, large and will go on any market in fine condition. I would say to the beginner in berry culture to go slow until you have gained some experience, as it is generally the bright side of berry growing one hears through the papers. The disappointments are seldom or never published.

While I have been fairly successful in growing berries, I could write several pages of disappointments.

TREES AND FRUITS IN THE RED RIVER VALLEY.

(A Communication from Rev. O. A. St. Solem, Halstad.)

In regard to trees I would recommend will say, that all of our wild growing trees here are good. The elm first. For a quick growing windbreak the box elder is very good. The plum ought to be planted as a windbreak and a fruit-bearing tree. Every home ought to have several hundred plum trees in the yard. Select the best from the woods, the basswood, ash and the hackberry. Of imported trees I would recommend the Eup. white birch and Eup. larch. I plant the trees for windbreaks two feet apart in the rows, and rows eight or ten feet apart, the same kind of trees in each row but not more than one row of one kind.

Evergreens: American white spruce, red cedar, Norway spruce, Scotch pine, Picea pungens, Douglas' spruce, American arbor vita and the white pine, all nursery grown. I do not recommend wild evergreens. A stockman will not recommend scrub stock. He will always talk blooded stock, and a nurseryman will also recommend nursery grown stock. I have tried both.

Apples: Hibernal, Patten's greening, Duchess and Arctic.

Crabs: Virginia, Martha. Have discarded the Transcendent on account of blight.

Raspberries: Hansell, Turner, and Caroline for yellow.

Currants: Victoria, Red and White Dutch, White Grape, Prince Albert.

Gooseberries: Houghton.

I have found the above named varieties after several years experience to be profitable. Have tried other varieties with more or less success.

Yes, the jack rabbit can be combated. I have not been bothered with him for several years. One way is to place a half bushel of oats in a heap near an outbuilding to feed the rabbits on. Then wait about a month and on a nice clear evening with bright moonshine hide in the outbuilding with a good shotgun and lots of shells. Do not leave the building to pick up the rabbits until through shooting. One evening I killed ten. I have also buried steel traps in the oats or on the outside of the oats, fastened to a chunk of wood.

Several of my apple trees have just commenced to bear. I expect a fair crop of apples this year. My trees look very healthy, and the whole orchard is in a nice condition.

IN MEMORIAM, DR. T. H. HOSKINS, NEWPORT, VT.

Died June 26, 1902, aged 74 years.

Dr. Thomas Henry Hoskins of this town, who died recently, was well known in former years as a horticultural and agricultural writer of repute. He had been practically dead to the present world for over three years by reason of the failure of his once brilliant mind.

Born in Gardiner, Me., on the 14th of May, 1828, he was seventy-four years of age some weeks previous to his death. He leaves a widow and one child, wife of Rev. J. B. Spiers, pastor of the New Jerusalem church in Contoocook, N. H. His father, Henry Box Hoskins, a paper manufacturer, was one of Gardiner's most highly respected citizens, repeatedly serving his city as treasurer, mayor and member of the legislature. Coming from a stock of sterling integrity and great mental ability on his father's side (his great-grandfather was William Henry Hoskins, a merchant of Boston, and acting commissiary in the Revolutionary war, whose remains now rest in the vaults of the historic Old South Church of that city), his antecedents on his mother's side were no less worthy.

It was on his grandfather's farm that Dr. Hoskins imbibed the love for the soil which he always retained. He early showed a fondness for newspaper work, owning, editing, and printing a paper of

his own at thirteen years of age. He received his academic education at the Gardiner Lyceum. In 1849, at twenty-one years of age, he started for California in company with other young men of his city, but, not liking the manners of his companions, he left them and finally located in Louisville, Ky., where he remained nearly thirteen years. He engaged in the drug business, first as clerk, then as partner, and later studied medicine in the medical department of

DR. T. H. HOSKINS.
Late of Newport, Vt.

the University of Louisville, at the same time carrying on a market garden just outside the city.

Graduating at the head of a large class, he became assistant professor of anatomy, translated French and German works for the university, and practiced his profession until in 1861, just before the war, he removed to Boston. Here he remained several years, being surgeon to several institutions, one of the physicians of the Boston Dispensary for four years, also engaged as an editorial writer on the Boston Courier, and as lecturer in Dio Lewis' school.

In the winter of 1865-66 he received a severe spinal injury by a fall on the icy pavement, which incapacitated him for further practice of his profession and, for many months, for anything whatsoever. He came to this town to recuperate his health, became enamored of the locality and decided to remain and experiment in hardy fruits for the cold regions. He began to establish a nursery at West Derby, Vt., about 1868, experimenting very carefully with many varieties. It required not only money, but courage, patience and experience to solve, as he finally very largely did, the problem of tree fruits for northern New England and lower Canada. In the selection and introduction of ironclad Russian fruits, including apples, pears, plums and cherries, of various qualities and seasons, he was associated with J. L. Budd, professor of horticulture in Iowa University, and Charles Gibb, of Montreal.

The latter made two trips to Russia in pursuit of new varieties, and shared his spoils with the doctor. He gave to the public the Yellow Transparent (Russian) and the Scott's Winter (native) varieties of apple, and in his seed business, which he conducted until 1899 an auxiliary to his nursery and market garden, he originated and propagated several varieties of vegetables.

In 1870 Dr. Hoskins started the Vermont Farmer at Newport, and after two years removed it to St. Johnsbury, where it was conducted four years with himself as editor and Royal Cummings as publisher, reaching a circulation of 4,000. He then sold his interest to Mr. Cummings.

He was a popular member of the State Board of Agriculture, and for many years was in demand as a speaker at horticultural meetings in Vermont, New Hampshire, Maine and Massachusetts. Always a public-spirited citizen wherever he resided, he was one of the founders and first contributors to the Newport public library, and the first president of the library association. Extremely versatile, he had poetic, artistic and histrionic talent, an extraordinary command of language and gift of expression, combined with a strong love of humanity. With all this he was possessed of great industry and a systematic and orderly disposition.

He may be forgotten by all but a few, but his work will remain an important contribution to progress along the lines where his work lay, and his life is yet another example of the truth of the words of the poet:

"Lives of great men all remind us
We can make our lives sublime,
And departing leave behind us
Footprints on the sands of Time."

—Express and Standard, Newport, Vt.

OWATONNA TRIAL STATION, REPORT MADE AUGUST, 1902.

E. H. S. DARTT, SUPT.

There was nothing remarkable about our last winter. No root-killing and very little blight has appeared, and that mostly on Russian varieties. The more than 500 varieties originated here have been selected because of their vitality and freedom from blight, and to avoid blight we must not plant blight-carrying kinds.

Alternate rows were girdled last year about July first. There was a full bloom, but apples dropped badly, so that the crop now remaining is very light. I am certain now that spraying prevents dropping. I have been largely in the apple business more than fifty years, twenty years in Wisconsin and the last thirty-two years in Minnesota. My experience will no doubt be beneficial to the rising generation. I have been spraying for several years. Last year trees blossomed so lightly that I thought it would not pay to spray at all, but I concluded to spray my largest orchard of about 2,500 trees. I used one-fourth pound of Paris green to fifty gallons of water at a total expense of less than one cent per tree. Apples were smooth and salable and netted me not less than $500. I have another orchard of 500 Duchess. This I did not spray. Apples dropped badly, and I gathered about ten bushels, which were of little value on account of being ill shaped and knotty. I think I would have saved $100 per day by spraying this orchard also.

This year promised to be the bearing year. There was a full bloom, and I sprayed the large orchard as usual, and but for the very hard winds I would have a good crop. As it is, I think I will get 1,000 bushels, perhaps a quarter crop. I preferred that the Duchess orchard should not bear this year, preferring a crop next year instead. My belief is that if we remove the fruit these fruitful years and girdle we will get the fruit the following year. It is a great deal of work to remove fruit by hand, so I sprayed a part of this orchard at blossoming time with salt at the rate of four quarts to 50 gallons of water; this killed most of the blossoms and a little of the foliage, and I think the chance very fair for crop next year. Girdling need not be done on very productive kinds like Duchess.

The apples on the part of this orchard not sprayed dropped badly, and wind has taken off most of the remainder, so that this part of the orchard is also in good condition for next year's crop, and I conclude that with plenty of wind and insects we need not spray with salt to thin fruit. It will be thin enough.

Among the great number of seedlings that have been produced here and brought into very early bearing by girdling nothing wonderful has appeared, though I have several varieties that compare favorably with the Wealthy in size and quality and keep much longer.

ROSES: THEIR SUCCESSFUL CULTIVATION AND VARIETIES.

J. M. UNDERWOOD, LAKE CITY.

1st. Sunlight.—The first requisite is plenty of sunlight. It will not do to plant them in a shaded place, for the sun is needed to warm the soil and stimulate the root system; it is needed to ripen the wood for the long sleep of winter, and in blossoming time to furnish the warmth that distils the delicate perfume and to impart the beauty of coloring that places the rose on its throne as the queen of flowers.

2nd. Moisture.—The next most important requirement is moisture. This can only be made certain by some provision for irrigating the ground during the dry periods. It can be taken from the water system of the town, or a good and cheap plan is to have a tank or reservoir filled from a well by a windmill. Water should be applied by thoroughly soaking the ground so that it is full of moisture, much as a hard rain of several hours would do it. When in bloom the blossoms should not be showered too much, but the water should run on the ground in little ditches from one bush to another until it has taken up all that it will. The time to irrigate is before the ground is dry and suffering from thirst. Do not spray the surface of the ground and imagine that the roots have had enough. Be liberal when you do water them and then let them go until they *need* more. Usually the ground is wet enough early in the spring; but it is sometimes dry at that season, and the roots need a wetting the first thing after they are uncovered. During the month of October do not water the ground, but allow the growth to stop and the wood to ripen for winter.

3rd. Soil.—The ideal soil for roses is a good rich clay loam. They will do well in *sandy* soil if a little clay and plenty of rich manure is mixed with it, and it is then generously watered. They will not do well in hard clay that is impervious to water or in gravel that drains it all away.

4th. Cultivation.—This is very important, for it helps to stimulate the action of the roots by quickly imparting to them the food

and drink that is applied to the ground. After fertilizers are applied they should be cultivated in; and when the ground is irrigated it should be allowed to dry a little on the surface and then stirred to make it fine and loose so as to prevent evaporation and drying out. Surface cultivation should be given the ground at least once a week, from the time the bushes are uncovered until October.

5th. Protection.—In late fall, before severe freezing weather sets in, choose a dry time to cover the bushes. See that the ground is thoroughly wet so that the roots will not dry out during the winter, for it will be a long time before they will have another chance to take a drink.

In wintering roses the main thing is to keep the bushes dry. I have found the best way to do this is to first make a bed of dry straw or leaves for the bushes to lie on. It should be six or more inches deep. Bend the bushes over and lay them gently on the bed and cover them with two feet of dry straw, making it highest in the middle, much like the roof of a house. Then cover the straw with boards. Short pieces can be nailed to a ridge pole and to a strip at the lower end, making it quite steep so as to shed water easily; or, boards can be used horizontally, by commencing at the base of the straw on each side, lapping the boards an inch and using enough nails to hold them in place. A narrow board at the top can hold the two sides together. Put boards at the end to keep out the wet and to hold the straw in place. Leaves or hay can be used in place of straw. Do not uncover in the spring until freezing weather is over, but uncover before they start their growth. Where there is danger from mice, place poisoned grain where they will get it.

6th. Planting.—The best time to plant is in *early* spring, before the bushes have started to grow. If they are on their own roots, they should be set two to three inches deeper than they grew in the nursery; if they are budded roses, they should be set four to six inches deeper. Mud the roots in *thick* mud before planting and set them very firmly.

7th. Pruning.—Keep all old or dead branches cut out; and with budded roses be sure to keep all sprouts from the roots cut back deep in the ground, or they will take all growth from the top and cause it to dwarf and die. In the spring, prune the tops back to about four feet and cut off all the tops that look black or dry back to the fresh buds.

8th. What to Plant.—If one is careful to keep back the suckers, a budded rose will make the best growth and prove the best to blossom; and some roses are such poor growers that they can be grown successfully only by budding them on Manetti stock.

Roses on their own roots are usually preferred, for if they live there will be no doubt as to their quality. They are produced by taking cuttings from the new growth and rooting them in sand. It is necessary to do this in a greenhouse.

9th. Diseases and Insects.—As in everything else the old saying "An ounce of prevention is worth a pound of cure," holds good in this case. The best way to *prevent* disease in rose bushes is to give them good cultivation and do all that is necessary to secure a strong, vigorous growth. Disease always attacks the weak more quickly than the strong; and this fact must be carefully borne in mind, thorough cultivation is absolutely necessary in combating the ravages caused by disease and insects.

Sudden changes of temperature may cause mildew, and it cannot be prevented as it can in the greenhouse. Dusting the bushes with sulphur will assist in preventing it. Keep up the cultivation, furnish moisture, and as the weather grows warm again the plants will revive and outgrow the disease.

The Red Spider—Is most likely to attack the bushes when it is dry and warm. They are very small and are not discovered until they have become numerous. The bushes begin to look unhealthy, and the leaves have a sickly appearance and will begin to drop off unless the insects are killed before they have reached the last stages of disease. They can be controlled by spraying with cold water and keeping the bushes quite damp. Morning is the best time in which to do it, and the under part of the leaves require special attention.

The Aphis—Can be controlled by spraying with tobacco water.

The Rose-Thrip.—A very small white fly or midge that is found on the under side of the leaves; can be destroyed by spraying with tobacco water. This also acts as a preventive of this pest.

The Rose Bug—Is a beetle which attacks the buds before they have had time to develop, and eats out the center. A poison to destroy these would need to be so strong that it would necessarily injure the plant; so the only alternative is to pick them off and destroy them as potato bugs are destroyed. Fortunately but few localities are troubled with this pest and persistent effort will abate the nuisance.

The Rose Slug—Is the most troublesome of all the pests that molest our outdoor roses, but a knowledge of the habits of its progenitor will enable the grower to eradicate it quickly. It is the larva of the saw-fly. This fly comes from the ground during the latter part of May when the rose foliage is reaching good form. The female deposits its eggs in incisions made in the leaves on the under side. These eggs hatch in from 12 to 15 days, and the little grub

emerging therefrom at once begins to eat the leaves. They are light green in color. An early application of white hellebore sprinkled on the bushes in the early morning while the foliage is damp is a good remedy. For all of these pests it is best to be ready and give them their medicine before they have had time to do much damage or increase in numbers. "The early bird catches the worm."

10th. Varieties.—In our climate Tea Roses are not hardy, but they will furnish beautiful flowers to those who are willing to undertake the necessary work and light expense requisite to grow them successfully. Some of the June and Moss roses are desirable and the Hybrid Perpetuals are very fine. The following list will be found reliable and desirable:

Cinnamon Rose: An old time favorite. Coming at a season when outdoor roses are scarce, its irregularity of form is willingly overlooked, and its appearance is greeted with kindly spirit.

Old Blush: Double, and a delicate blush pink. Very fragrant. It is so old that it is quite a novelty nowadays.

The Wild Roses: There is quite as great a variety in the shades of red among these as in the cultivated double varieties. In habit of growth they appear as low trailers, medium bushes and as climbers. The flowers should never be cut, but left to mature fruit, as the bright-colored haws are very ornamental, remaining on all winter.

Scotch Roses: Natives of England and Scotland; mainly desirable for their hardiness, Stanwell's being one of the best. Stanwell's Perpetual: Blush, medium size, double, delicately scented, foliage very small, nine to eleven leaflets; dark reddish brown wood, numerous small spines. A hybrid which blooms in the autumn.

JUNE ROSES.

Magna Charta: Pink suffused with carmine; full globular; foliage and wood light green with numerous dark spines. A fragrant, excellent rose.

Madam Plantier: Pure white, above medium size, full. Produced in great abundance early in the season. Foliage rather small. Seven leaflets. One of the best white roses for hedges and for massing in groups.

Harrison's Yellow: Golden yellow; medium size, semi-double; generally has nine leaflets; a freer bloomer than Persian Yellow.

Persian Yellow: Bright yellow; small, nearly full, well formed, small foliage; faintly scented like the Sweet Brier; seven leaflets. The wood is chocolate brown in color, armed with numerous brown thorns. It is the finest of all hardy yellow roses.

RUGOSA ROSES.

Rugosa Alba: Single, pure white flowers of five petals; highly scented; a splendid shrub.

Rugosa Rubra: Flowers single and of a most beautiful bright rosy crimson, succeeded by large berries of a rich rosy red color and a great addition to the ornamental character of the plant.

Madam G. Bruant: One of the first of the new race of hybrids. In the bud state the flowers are long and pointed; when open, semi-double, pure white and fragrant, and produced freely in clusters at intervals throughout the summer. Exceptionally hardy and vigorous.

MOSS ROSES.

Salet Moss: Light rose, medium size, flat form, fairly good buds, very free bloomer.

Crested Moss: Deep pink colored buds, surrounded with a mossy fringe and crest A fragrant and very beautiful rose.

Comtesse de Murinais: White, tinged with flesh. Vigorous grower.

Princess Adelaide: Pale rose, medium size, not very mossy, but good in bud and flower; dark foliage which is often variegated. Foliage strong and vigorous.

Glory of Mosses: Pale rose, very large, full flat forms, not attractive in the bud. The foliage is very large.

CLIMBING ROSES.

Prairie Queen: Rosy-red, frequently with white stripes, medium or large size, double, foliage large, five leaflets, quite deeply serrated.

Crimson Rambler: Flowers are a bright, cheerful shade of crimson, and the great size of the clusters make it especially attractive. The flowers are double, about the size of a cherry blossom. A beautiful sight for about a month. A rapid grower. White, pink and yellow ramblers are very pretty, but not quite so hardy as above.

Baltimore Belle: Pale blush, changing to white; strong grower.

Gem of the Prairie: Rosy-red, occasionally blotched with white; large flat flowers, slightly fragrant.

Seven Sisters: Blush, tinged and striped with various shades; small or medium sized.

HYBRID PERPETUAL ROSES.

General Jacqueminot: Brilliant crimson, not full, but large and effective; fragrant and of excellent hardy habit.

Paul Neyron: Deep rose color, good tough foliage, wood rather smooth; by far the largest variety in cultivation. A free bloomer; very desirable as a garden rose.

Alfred Colomb: Carmine-crimson; large or very large, full; of fine globular form, extremely fragrant; green wood with occasional pale green thorns. Foliage large and handsome; a grand rose; the most useful in its class for general cultivation.

Clio: Flowers large of fine globular form, flesh color, shaded in the center with rosy pink; growth vigorous, handsome foliage, one of the best roses.

Ulrich Brunner: Brilliant cherry red, a very effective color; flowers of fine form and finish, carry well upon the plant. Petals of great substance; plant vigorous, hardy, and resists mildew.

Baroness Rothschild: Light pink, sometimes shaded with rose, large or very large, cupped form, very symmetrical, without fragrance. The wood is short jointed, thick, light green, armed with occasional light green thorns. One of the hardiest, but does not propagate from cuttings. A very distinct, beautiful rose, free blooming, and greatly valued both as an exhibition and a garden sort.

Anne de Diesbach: In color the most lovely shade of carmine; very large double flowers, fragrant. One of the hardiest. A very desirable garden rose.

John Hopper: Bright rose with carmine center; large and full, semi-globular; light green thorns; stout, bushy growth. A free blooming standard sort.

Margaret Dickson: Of magnificent form; white with pale flesh; petals very large, shell shaped and of great substance; fragrant. A fine variety; foliage very large dark green.

Marshal P. Wilder: It is of vigorous growth, with healthy foliage; flowers large, semi-globular, full, well formed; color, cherry carmine, and very fragrant. It continues to bloom profusely long after the other remontants are out of flower. It is undoubtedly the finest in color.

Mabel Morrison: Flesh white, changing to pure white. In the autumn it is sometimes tinged with pink; semi-double, cup-shaped flowers. A useful garden rose.

Marchioness of Londonderry: Flowers of great size, measuring seven inches across; perfectly formed and carried on stout stems. Color, ivory white, petals of great substance, shell shaped and reflexed; free flowering; highly perfumed; growth vigorous and foliage very handsome. One of the finest roses.

Baron de Bonstetten: Velvety maroon shaded with deep crimson; very dark and rich in coloring. A grand rose in every respect.

American Beauty: Large, globular, deep pink, shaded with carmine; delicious odor; has proved to be most desirable variety for forcing.

Fisher Holmes: May be briefly described as an improved General Jacqueminot; the flowers are fuller and more freely produced. A very valuable sort.

Mme. Gabriel Luizet: Pink, somewhat fragrant, large foliage; a promising kind, worthy of attention.

General Washington: Red, shaded with crimson, large, very full flat form; the flowers are often malformed, greatly lessening its value. A very profuse bloomer, and when in perfection a very fine sort.

Jean Liabaud: Crimson maroon illuminated with scarlet, large, full. A lovely rose, but shy in the autumn.

Mrs. John Laing: Soft pink, large and of fine form produced on strong stems; exceedingly fragrant; flowers continuously in the open ground.

Prince Camille de Rohan: Deep velvety crimson; large, moderately full. A splendid rose.

La France: Delicate silver rose, changing to silvery pink; very large, full, of fine globular form; a most constant bloomer. The

sweetest and most useful of all roses. None can surpass the delicacy of its coloring.

Coquette des Blanches: Pure white, sometimes faintly tinged with pink; flowers of medium size, somewhat flat, but full and very pretty; growth more bushy and symmetrical than any of the others. Later than the rest in coming into flower.

Coquette des Alps: White, slightly shaded with carmine; medium size; form semi-cupped; wood, long jointed. This and Coquette des Blanches the best white Hybrid Perpetuals.

A PLAN FOR HOME GROUNDS.

MISS MABEL G. PALMER, MINN. SCHOOL OF AGRICTLTURE.

The home grounds should be a picture. The lawn and gardens should be as attractive as it is possible to make them, and this kind of beauty is more surely secured by the use of taste and labor than by spending money.

Let us take a plot of about three acres, about thirty rods long and fifteen rods wide, on the south side of a farm of one hundred and sixty acres, a southwest quarter section. The plot is to be laid out into a lawn about the house, a vegetable and small fruit garden and a windbreak. The house is about one hundred feet from the road. Back of the house is the milk house and windmill.

The most important thing to bear in mind is that of having a definite plan before beginning work. This plan cannot be worked out in a year. It may take a life time to work it out. There is, however, a continued pleasure in seeing the farm grow to one's own plan and ideal. It will be something of which the generations that follow will be proud. One should plant around the borders rather than follow the usual plan of scattering the trees and shrubbery all over the lawn without any definite idea of why they are arranged in that way. This secures more real beauty and gives a nice open lawn in front of the house. If there is a lake or stream in the distance, leave or make an opening in the trees so that a view of it can be enjoyed from the windows and porches of the house.

The buildings and garden should be protected by a windbreak on the north and west sides. It should be so placed because the cold winds come from these directions. A good windbreak for Minnesota might consist of two rows of white willow, one row green ash, one row red cedar, and one row plum trees. They are all rapid growing trees and do well in Minnesota when not protected. The white willow is a good tree to plant on the outside for this reason.

In producing a good lawn, the first and most important thing is the soil. If one is careless in the preparation of the soil at the beginning, no amount of care afterward will make up for it. The soil should be as free from weeds, roots and stones as it is possible to make it. It should be pulverized deeply, raked fine and heavily manured. Use thoroughly decomposed stable manure. The best lawns of Minnesota are made of nearly pure Kentucky blue grass. A little white clover and red top are sown with it, because they start quickly and blue grass does not; but when the blue grass is once started it usually kills out the clover. Perhaps for this section three bushels of blue grass with five pounds solid red top, and five pounds white clover per acre is as good a mixture as any. Early spring is the best time for sowing the seed because there is plenty of water then, but if water is plentiful so the seed can be kept from dying out, August will be found a good time. The lawn around the house for thirty feet or more should be cut with the lawn mower. The rest of it can be cut with the field mower.

In a country place, it is a good plan to have as few drives and walks as possible, for they do not add to the beauty of the grounds. Have the drive at the side rather than in front of the house. Let these lead to their destination by the most direct curves. Crooked walks and drives are expensive and too often unsightly and neglected. If one is to have any drives or paths in the garden, I like a sod best as it is easy to start, easy to keep in order, and does not require much attention after it is once started.

Put trees, shrubs, or flowers in the curves as that will give a reason for having the curves where they are.

In the grounds on my plot there are several groups of flowers and shrubs along the driveway. At the main entrance is a group of Norway spruce. At the entrance toward the house is a bed of annuals. A bed of old-fashioned holyhocks forms an attractive spot at the entrance from the barn to the house. A wild grape arbor is found in one corner of this little plot about the driveway. The arbor is simple and yet a thing of beauty. Those who are familiar with the one on these grounds know what a good effect can be obtained with a few poles and a wild grape vine. Elm trees make a pretty shade tree along a drive and do well in Minnesota.

We cannot always make things as we wish them at once, but we can do a good deal to hide that which is not beautiful. Perhaps there is a board fence on one side of the lawn, or something else just as unsightly. Nature will help make such an object a thing of beauty if a few wild grape vines are set out where they can use the fence, stump or whatever it may be as a trellis.

In selecting trees and shrubs, select those that do best in the locality. The wild crab apple tree is both useful and ornamental. Its fruit makes delicious jelly, and I know of no flower more beautiful than the wild crab apple blossom. The cut-leaf birch makes a pretty ornamental tree because of its drooping habit and beautiful foliage.

The author of "The Solitary Summer" says, "My idea of a garden is that it should be beautiful from end to end and not start off in front of the house with fireworks going off at its farthest limit into sticks." If flowers are arranged in with the shrubbery, they are more effective. The flowers against the green background seem to show more what they are, show their character, as it were.

There is much that may be and ought to be said about back yards. The back yard is an index to the character of the people who occupy the house. To keep the back yard and porch looking as neat and tidy as the front yard and porch is a test that some of us cannot successfully meet. A back yard may be a place to which one can go for rest and be inspired by his surroundings, or it may be a place to avoid. All of the refuse from the kitchen should be taken care of as soon as possible and not allowed to stand around in the back yard. What cannot be utilized can be burned. Have the flowers here just as beautiful as those in the front yard.

The small fruit and vegetable garden should receive their full share of attention, but there is not time to describe them here.

Perhaps some one may ask, "Does landscape art pay?" There are many reasons for believing it does pay. There is an educational value in the beautiful. Hearts are softened and souls are strengthened by attractive surroundings. There is also a money value in the beautiful. Take, for example, a farm home with this embellishment and compare it with one where there are no trees, no shrubbery, where perhaps even flowers of any kind have not yet found their way. Which will sell for the highest price? Is there anything attractive about a barren farm home? Will any one care to think of such a place as home? The farm with the trees, shrubbery and flowers will bring the most money because of these attractions. Then there is a certain pride and pleasure in the home that has been handed down from generation to generation. As our country grows older, here, as in England, the family homestead will be reverenced. It is a worthy ambition to make a home, and like any other life work it requires a good plan, with years of devotion, to bring it to attractive perfection.

INTERESTING THE YOUNG IN HORTICULTURE.

(A Discussion.)

The President: I want to say something further to the young men. The suggestion was made some time ago, earlier in the session, that we must go after the young men and interest the young men in order to keep the society and the interest in it. It reminded me very forcibly of the first meeting I ever attended of the Minnesota Horticultural Society. I think the meeting was called to order with an attendance of about a dozen. It was not more than twelve years ago, I think, and of that dozen there were fully ten gray heads in the number, and as I look over the faces and heads of those present this morning I am very much impressed with the fact that we are getting hold of the young men, and I think it is one of the most encouraging features of our society, and I want to encourage the young men in their presence with us.

Mr. Dolan: The matter of getting after the youth is all right, but the proper and practical thing to do is to get after the younger ones still. The most of our children grow up and go through our public schools, high schools and colleges, and I do not believe that fifty per cent of them have any idea of landscape work. They scarcely know how to plant a tree. I think the proper place to reach the young men and women is to begin with the children in our schools. It is not necessary to devote a large portion of the school hours for this purpose. If our teachers would occasionlly make requests of the children to make sketches of their farm grounds, the location of the buildings and diagram of the farm, it would give them a start; they would become interested in it in the course of time, they would compare their little notes and plans, and I believe a great deal of good work might be done in some such way. The older people have become set in their ways, and while they may admire the finished product it is a difficult matter to arouse their enthusiasm, but with the young it is different if we would only begin in time.

The President: There is one thing we are apt to overlook. It is this, that our education does not come from the schools. I yield to nobody in my admiration of the work done in the public schools of this country, but all of the educating is not done there, and some of the very best education that we get anywhere we get outside of the schools. The young people that come in here and are set to thinking are getting a better education than they could anywhere else where they memorize and repeat the thoughts of others from memory. Mr. Loring, I have not a doubt, will say, to be a good landscape gardener a man must have an education. He may not

have a very good one, but he cannot get along in that line very long before he finds himself unfolding, developing, his brain is expanding, he is getting more power to do a little more than he could along that line. Anything that will set people to thinking, that will tend to make things clear to their minds and help them to learn to observe, to compare, to analyze and to remember all these things and to draw conclusions that cannot be set aside, that is education. As I said before, they learn something that interests them, and the more interest they take the more they develop, the faster they grow. Education is growth. We grow just as that tree that has been rightly planted, the one that the farmer and the horticulturist sets out and sets it out right; and that tree grows and develops just because it has been set out right. Thus it is in starting out these young minds; if we start them out right, we will find that "as the twig is bent the tree's inclined."

A PLEA FOR MORE TREE PLANTING.

Mr. C. H. Patten: I was much interested in the paper of Mr. Bush in which he enlarged somewhat upon the line of landscape gardening and home adornment. He recommended the planting of something like five acres of forestry upon the grounds, and I think previous to that he enlarged a little upon that; he rose from five to ten acres as I understood his paper. While we are talking about the adornment of the home, and there have been very many good and beautiful things said upon that subject here, we should at all times keep in mind the environment of these homes, and I wish to enlarge a little upon the thought expressed by Mr. Bush in regard to those larger plantings. I have been studying the topography of your state, and as I shall not be here tomorrow when this subject of forestry will be brought up I feel that I wish to say to this society that in my opinion they have a very great and important work to perform, and that work in order to be successful should be in harmony with the forestry association, from the fact that right here within fifty miles, or perhaps within sixty miles, to the north you have prairie conditions. The lumbermen have destroyed your timber, the country is like a plain stripped of its forest plantation—and how are you going to have these home grounds unless you have the environment suitable for homes? If the society will look into the future I think they will take the most active interest in the preservation of the forests as forests, and in educating the people not to cut the timber off their lands on the north and west sides, but to preserve a grove of timber on each farm. I have often noticed the tendency to strip

the timber from the farms and leave nothing. On the northeast you have the great lakes, and as soon as the timber is all cut off there will be nothing between you and the great lakes. The climate will change here, and the favorable environments you have today will be gone. The timber in the north and northwest will be gone. The favorable conditions that you have for making beautiful homes and pleasant grounds are gone in a large degree. Your society must redouble its efforts to produce trees of different kinds that will withstand the extreme conditions of your climate, because you have forgotten to look forward to protect those forests and to educate the people to maintain the forests. I have been impressed with these facts in traveling over this state somewhat, and I must say I was greatly disappointed. Not very long ago I was in a city of your state not very far from here, in a town of about 6,000 inhabitants, and I discovered but one single evergreen tree, four or five inches in diameter, and it could not be said that that was a monument for that town. It surprised me very much that the evergreen, that will grow as it grows here, was not more in evidence, or that such a condition should exist, and in listening to these papers recommending your people to adorn their homes the thought impressed itself upon my mind that the thing to do was to retain the environments you already have and to improve them, instead of permitting the great forest that you now have to disappear in the manner in which it is now going. I feel this society has a very important work to do in connection with the forestry association. (Applause.)

CURRANTS AND THEIR TREATMENT IN THE COMMERCIAL GARDEN.

S. R. SPATES, MARKVILLE.

A man having a rich and reasonably level piece of land has the battle half fought, and victory an assured fact, but as my land is quite inferior to the above, and as I am asked how I grow currants, I will proceed to unfold the mystery.

First—My land was ploughed as deep as two good horses could do the work; after which, with a winged shovel plow, I had furrowed out deep furrows six feet apart. As this land was gravelly, in order to obtain a measure of success, I filled the furrows two-thirds full of rich soil and yellow clay—and I go "heavy" on the clay for such conditions. After the above preparation I planted the bushes three and one-half feet apart in the furrows—planting deep and packing down the soil thoroughly. The hardest part of the matter with me was to obtain varieties suitable for the situ-

ation. Of course the nurserymen, always honest and anxious to please their friends, would, with a great flourish of skillful erudition, introduce new varieties, each candidate possessing merits that simply put their predecessor in the shade. But out of this long list of new varieties of today, the old Red Dutch gives the largest returns and is the ideal currant in flavor. The improved Red Dutch is much more desirable, as it is larger, etc. Out of the many varieties—novelties some were called—I finally settled on Red Dutch Improved, Victoria, Red Cross, and Fay's Prolific, which last is all right for size and quality, making more jelly to the pound than any other variety, but it should not be classed as prolific—'tis a failure in that sense.

Cultivation should be intense up to the time of picking. After picking it is a good plan to have a general cleaning up of the patch and one more cultivation, providing you attend to the cleaning up soon after picking.

Picking and selling currants is no fool of a job, and one that will not (?) bring out Christian virtues. Aside from the pleasure one enjoys of seeing fruit grow and expand, each honest day's labor adding to the size and quantity, it is indeed humiliating enough to lose your hellebore and Bordeaux mixture, and your time—that should have a real value—humiliating, I say, to think that after all your efforts you are confronted by a condition that is many times as bad as fungous diseases and currant worms combined. The condition mentioned above is the commission man to whom you consign your fruit, the "fruits of your labor." I am a modest man, so will not mention my experience, but will cite a lady horticulturist's experience with her currants. They were picked, and each bunch was pruned with scissors, and they made the finest four cases of currants one would see in a lifetime. Well, this pioneer received ten cents per case, forty cents total, and the cheering remark that "market was crowded today." The lady was out the currants, the case and boxes, and 48 cents per case for picking, all save forty cents worse than wasted. Currants cannot be sold for the highest figure every day; one must watch the market and the days as well, is my experience.

The second season after planting, manure liberally—but not as Bill Nye did his famous farm. He advised rubber boots, dead cats, etc.; but in this matter every one must be a law unto themselves.

I will conclude by a word or two on pruning. After all is cleaned up I take my pruning hook or shears. I commence by throwing out old wood, etc., leaving about six to eight or ten—as

you feel—good branches or stocks in each hill. I also cut back the past season's growth one-third or one-half, thereby securing better fruit. Be careful to carry out and burn all branches and rubbish generally, thus ridding your patch of myriads of insects.

I have been favored with good prices for No. 1 fruit, varying from $1.50 to $3 per 24-quart case. There is no profit at $1.50 per case for currants of Fay or Red Cross varieties.

Clean boxes and nice looking packages do much toward selling currants or any other products. But there is one crime committed each season by fruit pickers—and growers, too—an offense of the most unmitigated nature to perpetrate on patient, willing and long-suffering customers. There are thousands of cases sent off of fruit farms each season containing boxes not more than two-thirds full. I would like to be used as I use others, and I consider it a first-class outrage to sell berries unless each and every box is full. We sell berries by the box, and it means a full box every time. I know parties who for twenty years have sold fruit, and never allow a box to leave the place unless full, and they have customers today that have traded with them eighteen years. And they send their friends, too, that they may see the "wonderful things done."

Another matter: I never put leaves, nor sticks, nor worms in boxes that we send off. We always instruct pickers—and then look them up—that all trash must be put in boxes by themselves, and we pay them the same for them as good ones. In that way there is no profit nor object to pickers to do such work unless it is to be mean. We need careful attention on this line, as there was complaint made by many during 1901.

Mr. Poore: "I believe in the production of new fruits; it is too often as it is in the case of an invention, the inventor does not get anything. I think the originator of a new variety of fruit should have a patent on it. I believe the states should provide for the compensation of the originator of that fruit. It usually gets into the hands of speculators, and the originator does not get anything."

"If the wind is strong and drying, the windbreak should be partly of evergreens, if possible, so as to exclude it entirely from the orchard. Norway spruce and fir are largely used. But evergreens grow so slowly it is usually better to intersperse them with quick growing poplars or willows. The main point in every case is to use those trees which will grow the fastest and thrive the best in your locality."

MY EXPERIENCE WITH TREES IN MANITOBA.

THOS. MCLENNAN, BELMONT, MAN.

The first year I planted nothing but Manitoba ash-leafed maple, or box elder, and find they do very well, but they are not a very nice tree. Two years ago I commenced planting spruce, a native variety from the forest, and I have had all kinds of bad luck with them. I planted in 1899 thirty-six, and out of that number I only had a possible six living the next spring; they are doing finely. Last spring I went again to the bush and brought home sixty-one trees and planted them also in good warm soil, and out of that amount I have this year seven. So I have found out there is no money in getting bush trees.

Just to show you the difference between bush evergreens and nursery trees, I bought from a man in Brandon, H. L. Patmore, one Scotch pine, one balsam fir, one arbor vitae, one white spruce, all 2½ feet high, for experimental purposes; also four more white spruce from A. P. Stevenson, Nelson, Man., and they are all doing well. So now I am going in for nursery stock altogether.

I see by Professor Waldron, in the Horticulturist, that he says we are growing white pine at Brandon, Man. This is a mistake. There is no white pine growing in Brandon. There is Rocky Mountain pine, which he must have taken for white pine. There is a grove of Scotch pine here, six miles from town growing and arbor vitae and balsam fir and spruce, all about 17 feet high, and there was some white pine planted at the same time. They are only 3 feet high yet and awful scraggy things, and they are in a fine sheltered place. I am getting some white pine this spring, and I will be able to report on them in a few years and will let you know how they are doing.

Native plums and all kinds of currants do well here, such as Lee's Prolific, Naples, Champion, White Grape, etc.; also strawberries—and, in fact, we can grow anything after we get a shelter belt established. We can grow some kinds of hardy apples. We have all kinds of lilacs and honeysuckles; also caragana, roses, sweet briar, Virginia creeper and numerous other things all doing well.

PREMIUMS AWARDED ON FRUITS AND FLOWERS AT MINNESOTA STATE FAIR IN 1902.

Total amount of premiums awarded.....$1,216.75

CLASS 59—APPLES.

(Open to all.)

	1st Prem.	2nd Prem.	3rd Prem.	4th Prem.
F. I. Harris, La Crescent	$14.65			
A. B. Coleman, Long Lake		$13.00		
W. L. Parker, Farmington			$12.35	
O. M. Lord, Minnesota City				$10.00

Peck of Wealthy apples ($10.00 to be divided pro rata): A. A. Bost, Excelsior, $1.10; Thos. Redpath, Wayzata, 95c; A. D. Leach, Excelsior, 90c; H. H. Heins, Lydia, 90c; F. I. Harris, La Crescent, 70c; F. J. Butterfield, Long Lake, 70c. J. F. Wilcox, Minneapolis, 65c; Mrs. R. Krause, Rose Town, 65c; Frank Yahnke, Winona, 60c; O. M. Lord, Minnesota City, 60c; J. R. Cummins, Washburn, Minn., 45c.

Collection of ten varieties of apples, to be judged with special reference to the size, beauty and perfection of the fruit (crabs and hybrids excepted), $25.00 to be divided pro rata among all the exhibitors in this lot: F. I. Harris, La Crescent, $2.40; W. S. Widmoyer, Dresbach, $2.35; Ditus Day, Farmington, $2.25; Dewain Cook, Jeffers, $2; H. H. Heins, Lydia, $2; Thos. Talbert, Wayzata, $2; A. B. Coleman, Long Lake, $1.90; A. A. Bost, Excelsior, $1.90; O. M. Lord, Minnesota City, $1.60; C. P. Nichols, Northfield, $1.60; Mrs. S. R. Spates, Wayzata, $1.35; F. J. Butterfield, Long Lake, $1.35; A. B. Lyman, Excelsior, $1.20; J. R. Cummins, Washburn, $1.10.

CLASS 60—APPLES.

(For professionals.)

Collection, hybrids and crabs excepted ($75.00 to be divided pro rata): F. I. Harris, $20.00; J. A. Howard, Hammond, $16.00. J. W. Lufkin, Viola, $15.00; W. L. Parker, Farmington, $15.00; Frank Yahnke, Winona, $9.00.

Collection of hybrids and crabs, not to exceed ten varieties ($15.00, to be distributed pro rata): F. I. Harris, La Crescent, $3.35; W. L. Parker, Farmington, $3.35; J. A. Howard, Hammond. $2.95; O. M. Lord, Minnesota City, $2.75; Thos. Talbert, Wayzata, $2.60.

SINGLE PLATES.

	1st Prem.	2nd Prem.	3rd Prem.
Anisim—			
F. I. Harris, La Crescent	$1.00		
J. A. Howard, Hammond		$0.75	
J. W. Lufkin, Viola			$0.50
Antonovka—			
F. I. Harris, La Crescent	1.00		
Ben Davis—			
Frank Yahnke, Winona	1.00		
J. A. Howard, Hammond		.75	
O. M. Lord, Minnesota City			.50
Brett—			
J. A. Howard, Hammond	1.00		
W. L. Parker, Farmington		.75	
Borovinca—			
J. A. Howard, Hammond	1.00		
W. L. Parker, Farmington		.75	
L. W. Lufkin, Viola			.50
Borsdorf—			
J. A. Howard, Hammond	1.00		
Cross—			
W. L. Parker, Farmington	1.00		
F. I. Harris, La Crescent		.75	
Christmas—			
F. I. Harris, La Crescent	1.00		
Charlamof—			
W. L. Parker, Farmington	1.00		
F. I. Harris, La Crescent		.75	
J. A. Howard, Hammond			.50
Fameuse—			
Frank Yahnke, Winona	1.00		
J. A. Howard, Hammond		.75	
F. I. Harris, La Crescent			.50
Golden Russet—			
Frank Yahnke, Winona	1.00		
O. M. Lord, Minnesota City		.75	
Grundy—			
J. A. Howard, Hammond	1.00		
Haas—			

	1st Prem.	2d Prem.	3rd Prem.
W. L. Parker, Farmington	1.00		
J. A. Howard, Hammond		.75	
Judson—			
W. L. Parker, Farmington	1.00		
Kaump—			
J. A. Howard, Hammond	1.00		
Lowland Raspberry—			
W. L. Parker, Farmington	1.00		
Longfield—			
J. A. Howard, Hammond	1.00		
O. M. Lord, Minnesota City		.75	
F. I. Harris, La Crescent			.50
Malinda—			
J. A. Howard, Hammond	1.00		
Thos. Redpath, Wayzata		.75	
C. P. Nichols, Northfield			.50
McMahon White—			
J. A. Howard, Hammond		.75	
C. P. Nichols, Northfield			.50
Northwestern Greening—			
J. A. Howard, Hammond	1.00		
O. M. Lord, Minnesota City		.75	
Ostrokof—			
F. I. Harris, La Crescent	1.00		
Peter—			
Frank Yahnke, Winona	1.00		
J. A. Howard, Hammond		.75	
Thos. Redpath, Wayzata			.50
Phoebe—			
J. A. Howard, Hammond	1.00		
Peach—			
C. P. Nichols, Northfield	1.00		
Rollin's Prolific—			
J. A. Howard, Hammond	1.00		
W. L. Parker, Farmington		.75	
Red Queen—			
J. A. Howard, Hammond	1.00		
J. W. Lufkin, Viola		.75	
Repka Malenka—			
W. L. Parker, Farmington	1.00		
O. M. Lord, Minnesota City		.75	
J. W. Lufkin, Viola			.50
St. Lawrence—			
W. L. Parker, Farmington	1.00		
Frank Yahnke, Winona		.75	
J. A. Howard, Hammond			.50
Striped Anis—			
J. A. Howard, Hammond	1.00		
Tetofsky—			
C. P. Nichols, Northfield	1.00		
W. L. Parker, Farmington		.75	
Utter—			
O. M. Lord, Minnesota City	1.00		
J. A. Howard, Hammond		.75	
University—			
W. L. Parker, Farmington	1.00		
Wolf River—			
W. L. Parker, Farmington	1.00		
J. A. Howard, Hammond		.75	
Walbridge—			
F. I. Harris, La Crescent	1.00		
Adolph Anderson, Renville		.75	
O. M. Lord, Minnesota City			.50
Yellow Sweet—			
J. W. Lufkin, Viola	1.00		
Yellow Transparent—			
C. P. Nichols, Northfield	1.00		
J. A. Howard, Hammond		.75	

	1st Prem.	2nd Prem.	3rd Prem.	4th Prem.	5th Prem.	6th Prem.
Duchess—						
J. A. Howard, Hammond	$1.75					
W. L. Parker, Farmington		$1.50				
Thos. Redpath, Wayzata			$1.25			
F. I. Harris, La Crescent				$1.00		
J. W. Lufkin, Viola					$0.75	
C. P. Nichols, Northfield						$0.50
Hibernal—						
J. A. Howard, Hammond	1.75					
W. L. Parker, Farmington		1.50				
O. M. Lord, Minnesota City			1.25			

	1st Prem.	2nd Prem.	3rd Prem.	4th Prem.	5th Prem.	6th Prem.
C. P. Nichols, Northfield				1.00		
Thos. Redpath, Wayzata					.75	
J. W. Lufkin, Viola						.50
Okabena—						
W. L. Parker, Farmington	1.75					
J. A. Howard, Hammond		1.50				
O. M. Lord, Minnesota City			1.25			
Thos. Redpath, Wayzata				1.00		
Patten's Greening—						
J. A. Howard, Hammond	1.75					
W. L. Parker, Farmington		1.50				
Thos. Redpath, Wayzata			1.25			
C. P. Nichols, Northfield				1.00		
J. W. Lufkin, Viola					.75	
Peerless—						
W. L. Parker, Farmington	1.75					
Thos. Redpath, Wayzata		1.50				
J. A. Howard, Hammond			1.25			
C. P. Nichols, Northfield				1.00		
O. M. Lord, Minnesota City					.75	
Wealthy—						
F. I. Harris, La Crescent	1.75					
J. A. Howard, Hammond		1.50				
W. L. Parker, Farmington			1.25			
O. M. Lord, Minnesota City				1.00		
Adolph Anderson, Renville					.75	
Frank Yahnke, Winona						.50

PROF. SAM'L B. GREEN, Judge.

CLASS 61—APPLES.

(For amateurs.)

Collection, hybrids and crabs excepted ($75.00 to be divided pro rata): W. S. Widmoyer, Dresbach, $17.75; Ditus Day, Farmington, $15.00; Wm. Oxford, Freeburg, $15.00; H. H. Heins, Lydia, $12.25; A. D. Leach, Excelsior, $7.50; J. F. Wilcox, Minneapolis, $3.75.

Collection of hybrids and crabs, not to exceed ten varieties ($15.00 to be divided pro rata): Ditus Day, Farmington, $3.00; A. B. Coleman, Long Lake, $2.40; A. D. Leach, Excelsior, $2.10; F. J. Butterfield, Long Lake, $2.00; Wm. Oxford, Freeburg, $1.75; Mrs. S. R. Spates, Wayzata, $1.50; H. F. Busse, Minneapolis, $1.25; J. F. Wilcox, Minneapolis, $1.00.

	1st Prem.	2nd Prem.	3rd Prem.
Anisim—			
H. H. Heins, Lydia	$1.00		
H. F. Busse, Minneapolis		$0.75	
A. D. Leach, Excelsior			$0.50
Antonovka—			
F. J. Butterfield, Long Lake	1.00		
Dewain Cook, Jeffers		.75	
A. B. Coleman, Long Lake			.50
Ben Davis—			
Wm. Oxford, Freeburg	1.00		
W. S. Widmoyer, Dresbach		.75	
A. M. Mitchell, Hammond			.50
Brett—			
W. S. Widmoyer, Dresbach	1.00		
A. B. Coleman, Long Lake		.75	
A. B. Lyman, Excelsior			.50
Bode—			
W. S. Widmoyer, Dresbach	1.00		
Borovinca—			
Dewain Cook, Jeffers	1.00		
Wm. Oxford, Freeburg		.75	
A. B. Coleman, Long Lake			.50
Borsdorf—			
A. M. Mitchell, Hammond	1.00		
Cross—			
Dewain Cook, Jeffers	1.00		
Christmas—			
A. B. Lyman, Excelsior	1.00		
Charlamof—			
A. B. Coleman, Long Lake	1.00		
A. B. Lyman, Excelsior		.75	
H. H. Heins, Lydia			.50
Fameuse—			
W. S. Widmoyer, Dresbach	1.00		
Wm. Oxford, Freeburg		.75	
Ditus Day, Farmington			.50
Golden Russet—			
Wm. Oxford, Freeburg	1.00		

	1st Prem.	2nd Prem.	3rd Prem.
A. M. Mitchell, Hammond		.75	
Grundy—			
A. M. Mitchell, Hammond	1.00		
H. H. Heins, Lydia		.75	
Haas—			
W. S. Widmoyer, Dresbach	1.00		
Ditus Day, Farmington		.75	
H. H. Heins, Lydia			.50
Judson—			
H. H. Heins, Lydia	1.00		
Kaump—			
A. B. Lyman, Excelsior	1.00		
Geo. W. Strand, Taylor's Falls		.75	
J. R. Cummins, Washburn			.50
Lowland Raspberry—			
Ditus Day, Farmington	1.00		
A. B. Lyman, Excelsior		.75	
Longfield—			
S. M. Dickinson, Garden City	1.00		
A. W. Keays, Elk River		.75	
W. S. Widmoyer, Dresbach			.50
Malinda—			
S. O. Miller, Lakeville	1.00		
A. B. Lyman, Excelsior		.75	
Dewain Cook, Jeffers			.50
McMahon White—			
Ditus Day, Farmington	1.00		
W. S. Widmoyer, Dresbach		.75	
Wm. Oxford, Freeburg			.50
Northwestern Greening—			
Wm. Oxford, Freeburg	1.00		
H. F. Busse, Minneapolis		.75	
W. S. Widmoyer, Dresbach			.50
Ostrokof—			
Wm. Oxford, Freeburg	1.00		
W. S. Widmoyer, Dresbach		.75	
October—			
J. F. Wilcox, Minneapolis	1.00		
Peter—			
A. B. Coleman, Long Lake	1.00		
A. D. Leach, Excelsior		.75	
H. H. Heins, Lydia			.50
Phoebe—			
H. H. Heins, Lydia	1.00		
Peach—			
Ditus Day, Farmington	1.00		
Rollin's Prolific—			
W. S. Widmoyer, Dresbach	1.00		
St. Lawrence—			
Wm. Oxford, Freeburg	1.00		
F. J. Butterfield, Long Lake		.75	
Ditus Day, Farmington			.50
Striped Anis—			
F. J. Butterfield, Long Lake	1.00		
D. C. Hazelton, Cutler		.75	
Tetofsky—			
Wm. Oxford, Freeburg			.50
Utter—			
W. S. Widmoyer, Dresbach	1.00		
A. B. Lyman, Excelsior		.75	
Wm. Oxford, Freeburg			.50
University—			
A. D. Leach, Excelsior	1.00		
Wolf River—			
Wm. Oxford, Freeburg	1.00		
Leo Goldenstar, Garden City		.75	
W. S. Widmoyer, Dresbach			.50
Walbridge—			
F. J. Butterfield, Long Lake	1.00		
A. M. Mitchell, Hammond		.75	
Wm. Oxford, Freeburg			.50
Yellow Sweet—			
J. R. Cummins, Washburn	1.00		
A. W. Keays, Elk River		.75	
A. B. Lyman, Excelsior			.50
Yellow Transparent—			
F. J. Butterfield, Long Lake	1.00		
Wm. Oxford, Freeburg		.75	
A. B. Lyman, Excelsior			.50

	1st Prem.	2nd Prem.	3rd Prem.	4th Prem.	5th Prem.	6th Prem.
Duchess—						
A. A. Bost, Excelsior	$1.75					
A. D. Leach, Excelsior		$1.50				
D. C. Hazelton, Cutler			$1.25			
A. M. Mitchell, Hammond				$1.00		
Paul Burtzlaff, Stillwater					$0.75	
H. F. Busse, Minneapolis						.50
Hibernal—						
A. D. Leach, Excelsior	1.75					
A. W. Keays, Elk River		1.50				
D. T. Wheaton, Morris			1.25			
Ditus Day, Farmington				1.00		
H. F. Busse, Minneapolis					75	
A. A. Bost, Excelsior						.50
Okabena—						
Ditus Day, Farmington	1.75					
Dewain Cook, Jeffers		1.50				
H. H. Heins, Lydia			1.25			
Leo Goldenstar, Garden City				1.00		
A. M. Mitchell, Hammond					.75	
H. F. Busse, Minneapolis						.50
Patten's Greening—						
A. D. Leach, Excelsior	1.75					
Minnetonka Nursery Co., Excelsior		1.50				
H. F. Busse, Minneapolis			1.25			
S. O. Miller, Lakeville				1.00		
Ditus Day, Farmington					.75	
A. B. Lyman, Excelsior						.50
Peerless—						
A. D. Leach, Excelsior	1.75					
A. B. Lyman, Excelsior		1.50				
S. O. Miller, Lakeville			1.25			
Minnetonka Nursery Co., Excelsior				1.00		
Mrs. S. R. Spates, Wayzata					.75	
Gust Johnson, Excelsior						50
Wealthy—						
A. D. Leach, Excelsior	1.75					
H. H. Heins, Lydia		1.50				
H. F. Busse, Minneapolis			1.25			
W. S. Widmoyer, Dresbach				1.00		
F. J. Butterfield, Long Lake					.75	
Paul Burtzlaff, Stillwater						.50

PROFS. N. E. HANSEN, W. L. PARKER, Judges.

CLASS 62—CRABS AND HYBRIDS.

(Open to all.)

Collection not to exceed ten varieties ($30 to be divided pro rata): Thos. Talbert, Wayzata, $4.45; A. B. Coleman, Long Lake, $4.20; A. B. Lyman, Excelsior, $3.90. F. I. Harris, La Crescent, $3.70; C. P. Nichols, Northfield, $3.70; H. H. Heins, Lydia, $3.70; D. F. Akin, Farmington, $2.65.

SINGLE PLATES.

	1st Prem.	2nd Prem.	3rd Prem.
Dartt—			
W. J. Tingley, Stillwater	$1.00		
F. I. Harris, La Crescent		$0.75	
J. A. Howard, Hammond			$0.50
Early Strawberry—			
F. J. Butterfield, Long Lake	1.00		
C. P. Nichols, Northfield		.75	
J. A. Howard, Hammond			.50
Florence—			
A. A. Bost, Excelsior	1.00		
A. W. Keays, Elk River		.75	
Mrs. S. R. Spates			.50
Gideon's No. 6—			
W. L. Parker, Farmington	1.00		
J. A. Howard, Hammond		.75	
O. M. Lord, Minnesota City			.50
General Grant—			
W. L. Parker, Farmington	1.00		
J. A. Howard, Hammond		.75	
Ditus Day, Farmington			.50

	1st Prem.	2nd Prem.	3rd Prem.
Gibb—			
Mrs. S. R. Spates, Wayzata	1.00		
Hyslop—			
Leo Goldenstar, Garden City	1.00		
A. B. Coleman, Long Lake		.75	
D. C. Hazelton, Cutler			.50
Lyman's Prolific—			
A. A. Bost, Excelsior	1.00		
A. W. Keays, Elk River		.75	
A. B. Lyman, Excelsior			.50
Martha—			
W. L. Parker, Farmington	1.00		
J. A. Howard, Hammond		.75	
F. I. Harris, La Crescent			.50
Minnesota—			
H. F. Busse, Minneapolis	1.00		
H. H. Heins, Lydia		.75	
Paul Burtzlaff, Stillwater			.50
Orange—			
Ditus Day, Farmington	1.00		
J. R. Cummins, Washburn		.75	
J. A. Howard, Hammond			.50
Pride of Minneapolis—			
F. J. Butterfield, Long Lake	1.00		
A. B. Coleman, Long Lake		.75	
Mrs. S. R. Spates, Wayzata			.50
Shields—			
H. F. Busse, Minneapolis	1.00		
A. D. Leach, Excelsior		.75	
O. M. Lord, Minnesota City			.50
Sweet Russet—			
W. L. Parker, Farmington	1.00		
F. I. Harris, La Crescent		.75	
J. A. Howard, Hammond			.50
Tonka—			
Thos. Redpath, Wayzata	1.00		
H. H. Heins, Lydia		.75	
Isabella Barton, Excelsior			.50
Transcendent—			
Gust Johnson, Excelsior	1.00		
A. D. Leach, Excelsior		.75	
W. J. Tingley, Stillwater			.50
Virginia—			
Thos. Redpath, Wayzata	1.00		
A. B. Coleman, Long Lake, Minn		.75	
W. S. Widmoyer, Dresbach			.50
Whitney—			
Wm. Oxford, Freeburg	1.00		
Paul Burtzlaff, Stillwater		.75	
Mrs. S. R. Spates, Wayzata			.50

CLASS 63—SEEDLING APPLES.

(Open to all.)

	1st Prem.	2nd Prem.	3rd Prem.
Collection, excluding crabs and hybrids—			
D. F. Akin, Farmington	$8.00		
A. B. Lyman, Excelsior		$6.00	
D. C. Hazelton, Cutler			$4.00
Collection of crabs and hybrids—			
A. B. Lyman, Excelsior	6.00		
D. C. Hazelton, Cutler		4.00	
J. R. Cummins, Washburn			2.00
Fall variety, not sweet, never having received a premium at the Minnesota State Fair—			
A. B. Lyman, Excelsior	6.00		
Thos. Redpath, Wayzata		4.00	
A. B. Lyman, Excelsior			2.00
Winter variety, not sweet, never having received a premium at the Minnesota State Fair—			
Frank Yahnke, Winona	10.00		
A. B. Lyman, Excelsior		8.00	
D. F. Akin, Farmington			2.00
Sweet variety, never having received a premium at the Minnesota State Fair, of such excellent quality as to make it worthy of general cultivation; either for fall or winter—			
Frank Yahnke, Winona	6.00		
A. B. Lyman, Excelsior		4.00	
Thos. Redpath, Wayzata			2.00

PROF. SAM'L B. GREEN, Judge.

CLASS 64—PLUMS.

(Open to all.)

Sweepstakes collection ($50.00, to be divided pro rata): Martin Penning, Sleepy Eye, $20.00; Dewain Cook, Jeffers, $20.00; Jos. Wood, Windom, $10.00.

Collection, not to exceed 15 varieties, in uniform one pint jars, to be accompanied by a statement of the method used in putting them up. ($25.00 to be divided pro rata): O. M. Lord, Minnesota City, $13.00; Dewain Cook, Jeffers, $12.00.

Collection, not to exceed 15 varieties, not in glass; fruit of early ripening may be kept in cold storage. ($25.00 to be divided pro rata): Martin Penning, Sleepy Eye, $11.25; Dewain Cook, Jeffers, $8.75; Frank Yahnke, Winona, $5.00.

	1st Prem.	2nd Prem.	3rd Prem.
Cheney—			
W. J. Tingley, Stillwater	$1.00		
C. D. Caneday, Taylor's Falls		$0.75	
A. W. Keays, Elk River			$0.50
De Soto—			
H. F. Busse, Minneapolis	1.00		
Frank Yahnke, Winona		.75	
W. H. Brimhall, Merriam Park			.50
American Eagle—			
Dewain Cook, Jeffers	1.00		
Forest Garden—			
Dewain Cook, Jeffers	1.00		
J. A. Howard, Hammond		.75	
W. J. Tingley, Stillwater			.50
Hawkeye—			
Dewain Cook, Jeffers	1.00		
A. W. Keays, Elk River		.75	
New Ulm—			
Dewain Cook, Jeffers	1.00		
Rockford—			
A. W. Keays, Elk River	1.00		
Dewain Cook, Jeffers		.75	
C. D. Caneday, Taylor's Falls			.50
Rollingstone—			
Geo. W. Strand, Taylor's Falls	1.00		
Frank Yahnke, Winona		.75	
A. W. Keays, Elk River			.50
Stoddard—			
Dewain Cook, Jeffers	1.00		
Frank Yahnke, Winona		.75	
H. F. Busse, Minneapolis			.50
Weaver—			
H. F. Busse, Minneapolis	1.00		
W. H. Brimhall, Merriam Park		.75	
Wolf—			
J. A. Howard, Hammond	1.00		
Dewain Cook, Jeffers		.75	
Gust Johnson, Excelsior			.50
Wyant—			
Frank Yahnke, Winona	1.00		
Dewain Cook, Jeffers		.75	
Seedling—			
Dewain Cook, Jeffers	5.00		
Martin Penning, Sleepy Eye		3.00	
A. W. Keays, Elk River			2.00
Pears—			
F. I. Harris, La Crescent	2.00		
Dewain Cook, Jeffers		1.00	
Peaches—			
Minnetonka Nursery Co., Excelsior	2.00		
Sand cherries, hybrids—			
A. W. Keays, Elk River	1.00		
A. D. Leach, Excelsior		.50	

WYMAN ELLIOT, Judge.

CLASS 65—GRAPES.

Collection ($60.00, to be divided pro rata): Gust Johnson, Excelsior, $32.00; A. A. Bost, Excelsior, $20.00; Isabella Barton, Excelsior, $8.00.

	1st Prem.	2nd Prem.	3rd Prem.
Agawam (Roger's No. 15)—			
Gust Johnson, Excelsior	$1.50		
A. A. Bost, Excelsior		$1.00	
Aminia (Roger's No. 39)—			
Gust Johnson, Excelsior	1.50		
Barry (Roger's No. 43)—			
Gust Johnson, Excelsior	1.50		
Brighton—			
Gust Johnson, Excelsior	1.50		
A. A. Bost, Excelsior		1.00	
Concord—			
Gust Johnson, Excelsior	1.50		
A. A. Bost, Excelsior		1.00	
Isabella Barton, Excelsior			$0.50
Cottage—			
Gust Johnson, Excelsior	1.50		
A. A. Bost, Excelsior		1.00	
Delaware—			
Gust Johnson, Excelsior	1.50		
A. A. Bost, Excelsior		1.00	
Isabella Barton			.50
Duchess—			
Gust Johnson, Excelsior	1.50		
Early Victor—			
Gust Johnson, Excelsior	1.50		
Isabella Barton		1.00	
Eldorado—			
Isabella Barton, Excelsior	1.50		
Empire State—			
Gust Johnson, Excelsior	1.50		
Herbert (Roger's No. 44)—			
Gust Johnson, Excelsior	1.50		
Iona—			
Gust Johnson, Excelsior	1.50		
A. A. Bost, Excelsior		1.00	
Janesville—			
A. A. Bost, Excelsior	1.50		
Lindley (Roger's No. 9)—			
Gust Johnson, Excelsior	1.50		
Lady—			
Gust Johnson, Excelsior	1.50		
A. A. Bost, Excelsior		1.00	
Martha—			
Gust Johnson, Excelsior	1.50		
A. A. Bost, Excelsior		1.00	
Massasoit (Roger's No. 3)—			
Gust Johnson, Excelsior	1.50		
Moore's Early—			
A. A. Bost, Excelsior	1.50		
Gust Johnson, Excelsior		1.00	
Isabella Barton, Excelsior			.50
Niagara—			
Gust Johnson, Excelsior	1.50		
Isabella Barton, Excelsior		1.00	
Pocklington—			
Gust Johnson, Excelsior	1.50		
Isabella Barton, Excelsior		.75	
A. A. Bost, Excelsior			.50
Pokeepsie, Red—			
Gust Johnson, Excelsior	1.50		
Isabella Barton, Excelsior		1.00	
Telegraph—			
Gust Johnson, Excelsior	1.50		
Wilder (Roger's No. 4)—			
Gust Johnson, Excelsior	1.50		
Woodruff Red—			
Gust Johnson, Excelsior	1.50		
Isabella Barton, Excelsior		1.00	
Worden—			
Gust Johnson, Excelsior	1.50		
Isabella Barton, Excelsior		1.00	
Wyoming Red—			
Gust Johnson, Excelsior	1.50		
Isabella Barton, Excelsior		1.00	

R. L. MACKINTOSH, Judge.

CLASS 66—FLOWERS.

(For professionals.)

PLANTS.

	1st Prem.	2nd Prem.	3rd Prem.	4th Prem.
Collection of foliage and decorative plants—				
Minneapolis Floral Co., Minneapolis	$35.00			
R. J. Mendenhall, Minneapolis		$30.00		
E. Nagel & Co., Minneapolis			$20.00	
John Vasatka, Minneapolis				$15.00
Collection of greenhouse plants—				
R. J. Mendenhall, Minneapolis	20.00			
Minneapolis Floral Co., Minneapolis		15.00		
E. Nagel & Co., Minneapolis			10.00	
John Vasatka, Minneapolis				5.00
Collection of climbing vines—				
R. J. Mendenhall, Minneapolis	2.00			
John Vasatka, Minneapolis		1.00		
E. Nagel & Co., Minneapolis			.50	
Collection of five hanging baskets, one of a kind—				
Minneapolis Floral Co., Minneapolis	4.00			
E. Nagel & Co., Minneapolis		3.00		
R. J. Mendenhall, Minneapolis			2.00	
Collection of coleus—				
John Vasatka, Minneapolis	2.00			
E. Nagel & Co., Minneapolis		1.00		
R. J. Mendenhall, Minneapolis			.50	
Collection of tuberous-rooted begonias—				
R. J. Mendenhall, Minneapolis	4.00			
Minneapolis Floral Co., Minneapolis		3.00		
John Vasatka, Minneapolis			2.00	
Single specimen palm—				
R. J. Mendenhall, Minneapolis	4.00			
John Vasatka, Minneapolis		3.00		
E. Nagel & Co., Minneapolis			2.00	
Minneapolis Floral Co., Minneapolis				1.00
Collection geraniums, in bloom—				
John Vasatka, Minneapolis	4.00			
R. J. Mendenhall, Minneapolis		3.00		
Minneapolis Floral Co., Minneapolis			2.00	
E. Nagel & Co., Minneapolis				1.00
Collection of carnations, in bloom—				
E. Nagel & Co., Minneapolis	3.00			
John Vasatka, Minneapolis		2.00		
Minneapolis Floral Co., Minneapolis			1.00	
Vase filled with plants—				
E. Nagel & Co., Minneapolis	4.00			
Minneapolis Floral Co., Minneapolis		2.00		
R. J. Mendenhall, Minneapolis			1.00	

CUT FLOWERS.

	1st Prem.	2nd Prem.	3rd Prem.
Collection of asters—			
E. Nagel & Co., Minneapolis	$3.00		
Geo. Mohler, St. Paul		$2.00	
Minneapolis Floral Co., Minneapolis			$1.00
Collection of carnations—			
Minneapolis Floral Co., Minneapolis	3.00		
E. Nagel & Co., Minneapolis		2.00	
John Vasatka, Minneapolis			1.00
Collection of roses—			
Minneapolis Floral Co., Minneapolis	3.00		
R. J. Mendenhall, Minneapolis		2.00	
John Vasatka, Minneapolis			1.00
Collection of petunias—			
E. Nagel & Co., Minneapolis	2.00		
Geo. Mohler, St. Paul, Minn		1.00	
John Vasatka, Minneapolis			.50

GUST MALMQUIST, Judge.

DESIGNS, BASKETS AND BOUQUETS.

	1st Prem.	2nd Prem.	3rd Prem.	4th Prem.
Floral design, cross and crown—				
Wm. Donaldson & Co., Minneapolis	$15.00			
E. Nagel & Co., Minneapolis		$10.00		
R. J. Mendenhall, Minneapolis			$6.00	
John Vasatka, Minneapolis				$4.00
Twelve-inch basket of flowers—				
Minneapolis Floral Co., Minneapolis	5.00			
E. Nagel & Co., Minneapolis		3.00		
R. J. Mendenhall, Minneapolis			2.00	
John Vasatka, Minneapolis				1.00
Pyramid bouquet—				
Minneapolis Floral Co., Minneapolis	3.00			
E. Nagel & Co., Minneapolis		2.00		
Alex Kunze, St. Paul			1.00	
Hand bouquet, nine inches across—				
R. J. Mendenhall, Minneapolis	3.00			
Minneapolis Floral Co., Minneapolis		2.00		
E. Nagel & Co., Minneapolis			1.00	
John Vasatka, Minneapolis				.50
Bridal bouquet, white flowers—				
R. J. Mendenhall, Minneapolis	3.00			
Minneapolis Floral Co., Minneapolis		2.00		
John Vasatka, Minneapolis			1.00	

MRS. M. M. BARNARD, MRS. W. A. JONES, Judges.

CLASS 67—CUT FLOWERS.

(Amateurs.)

	1st Prem.	2nd Prem.	3rd Prem.
Collection of asters—			
Mrs. R. Krause, Rose Town	$2.00		
Miss E. O'Reilly, Merriam Park		$1.00	
Mrs. A. E. Webster, Minneapolis			$0.50
Collection of coreopsis—			
D. Gantzer, Rose Town	2.00		
Mrs. R. Krause, Rose Town		1.00	
F. H. Gibbs, St. Paul			.50
Collection of dahlias—			
Alex Kunze, St. Paul	2.00		
D. Gantzer, Rose Town		1.00	
Mrs. S. R. Spates, Wayzata			.50
Collection of everlasting flowers—			
Mrs. R. Krause, Rose Town	2.00		
D. Gantzer, Rose Town		1.00	
F. H. Gibbs, St. Paul, Minn			.50
Collection of nasturtiums—			
F. H. Gibbs, St. Paul, Minn	2.00		
Mrs. E. R. Mohler, Merriam Park		1.00	
Mrs. A. E. Webster, Minneapolis			.50
Collection of pansies—			
Mrs. R. Krause, Rose Town	2.00		
F. H. Gibbs, St. Paul		1.00	
Miss E. O'Reilly, Merriam Park			.50
Collection of marguerite carnations—			
Mrs. A. E. Webster, Minneapolis	2.00		
F. H. Gibbs, St. Paul		1.00	
Alex Kunze, St. Paul, Minn			.50
Collection of verbenas—			
F. H. Gibbs, St. Paul	2.00		
D. Gantzer, Rose Town		1.00	
Mrs. A. E. Webster, Minneapolis			.50
Collection of zinnias—			
Miss E. O'Reilly, Merriam Park	2.00		
Mrs. E. R. Mohler, St. Paul		1.00	
Mrs. R. Krause, Rose Town			.50

E. NAGEL, Judge.

CLASS 68—MUSHROOMS.

$50.00, to be divided pro rata among the exhibitors.

	1st Prem.
Minneapolis Mycological club	$50.00

PROF. SAM'L B. GREEN, Judge.

Secretary's Corner.

PROF. GREEN AT THE WISCONSIN FAIR.—Prof. Samuel B. Green attended the Wisconsin State Fair the second week in September in the capacity of judge of fruit. He reports a good display of fruit and most hospitable treatment. Before returning he visited the commercial peach orchard region on the other side of the lake, in western Michigan.

APPLE SEEDLING ORCHARD AT RED WING.—On Sept. 17th Mr. Wyman Elliot visited a very interesting seedling apple orchard on the farm of Mr. T. E. Perkins, located six miles from Red Wing. A large number of varieties from this orchard were exhibited at the late state fair in the Goodhue county exhibit, and their examination at that time led up to this visit. As Mr. Perkins will give a history of this orchard and exhibit its fruit at the coming annual meeting of this society no detailed description of it will be given here, except to say that these trees are all grown from seed of the Malinda, a late winter variety, crossed with hardy Minnesota varieties.

SAVE SEEDLING APPLES FOR THE COMING ANNUAL MEETING.—At this meeting $75.00 will be offered as premiums for seedling apples, to be divided pro rata among all the exhibitors of fruit of merit, $25 for fall apples and $50 for winter apples. For particulars see full premium list published elsewhere in this "Sec'y Corner." Come to the meeting if possible and bring the seedlings along, but if you cannot come send by express to the secretary in good season. In this competition no good fruit is barred by the fact that it has already been shown at a previous meeting and taken a premium. We want to see it again in contrast with any other new or old seedling that may be displayed.

DO YOU KNOW OF ANY GOOD SEEDLING APPLES?—We are very desirous of getting out a full show of any early or late winter varieties of Minnesota seedling apples of merit at the coming annual meeting. As a member of this society and interested in the rapidly developing pomology of this region, you are also personally interested in this. If there are any such seedling trees anywhere in the state to your knowledge will you not consider it your special privilege to see that fruit from them is sent to that meeting, either by personally seeing the owners or by correspondence; or lacking the necessary opportunity send the address and brief statement of the fact to Sec'y Latham. There are many seedlings in the state without doubt of which little is known, and a determined and united effort on the part of the members of this society should ferrit them out.

GRAPES AT THE STATE FAIR FROM THE STATE EXPERIMENT STATION.—A fine display of some forty varieties of grapes was sent to the state fair just closed by Prof. Green from our State Experiment Station, including the sorts approaching ripeness at that time. There were some very handsome varieties in the collection, and it compared well with the competitive displays of specially selected specimens. The Beta, a hardy Minnesota seedling, was specially noticeable with its good sized, compact bunches of brilliant black grapes

It is fruiting very freely and is likely to prove a valuable kind for general planting. The Green Mountain is another of the newer varieties shown worthy of attention. The Brilliant grape is a kind not ripe at that time but has since been brought into this office by Prof. Green, fully ripe and developed, a very handsome bunch of large, amber-colored fruit. It is a cross between the Lindley and Delaware, one of Prof. Munson's crosses. The vineyards at the station should be visited by all lovers of the vine, as they contain a very full collection of the earlier ripening and hardier sorts, and present a valuable object lesson as to the results of intelligent care.

PRACTICAL FORESTRY TO BE TRIED IN NORTH MINNESOTA.—Our readers will be interested in the following extract from the Minneapolis Journal of Sept. 13, 1902, announcing, as it does, the inauguration in our state of a system of economic forestry. This practical expression of the growth of general sentiment on this subject may be considered a forecast of the treatment that public forests in this country are to receive, and private ownership will not be far behind as its economic value becomes apparent.

"Gifford Pinchot, chief of the bureau of forestry, E. S. Bruce official timber man, and other officials are in the Chippewa reservation country making a start under the provisions of the Morris timber bill. Mr. Bruce has charge of the work in the field, selecting about 230,000 acres for reforestation, and Mr. Pinchot is here in a supervisory capacity.

"The reforestation of these lands is one of the most important jobs brought before the bureau. The lands are to be made a forest reservation under control of the bureau. A certain amount of ripe timber is to be sold annually, and the land will be reforested according to the most advanced ideas of the bureau.

"For the first time, therefore, the government is making an attempt on a large scale to have economical logging operations conducted along forestry principles. A tract of thirty square miles is to be operated along these lines, and it is the selection of these lands that is occupying the attention of Pinchot and Bruce and their assistants."

PREMIUMS OFFERED ON APPLES AT THE COMING WINTER MEETING.

	3d Prem.	1st Prem.	2d Prem.
Collection of apples not to exceed 10 varieties	$2.00	6.00	4.00
Each variety of apples (or crabs) included in the 1901 fruit list of this society, or in the 1901 premium list of the Minnesota State Fair (kept in cold storage)		.50	.25
Each variety of apples (or crabs) included in the 1901 fruit list of this society, or in the 1901 premium list of the Minnesota State Fair (not kept in cold storage)		.50	.25
Peck of Wealthy apples, the fruit exhibited to be at the disposal of the meeting		2.00	1.00

EARLY WINTER SEEDLING.—The fruit shown must have been grown by the owner of the original tree and not kept in cold storage. A specimen of wood three years old (at least six inches long) taken from the tree bearing the apples shown, and a concise history and description of the tree and its fruit, must accompany each entry.

Competition is open to all except on such varieties as are being propagated for sale by some person other than the originator. Successful competitors who are not members of the society will be made so for the current year by deducting one dollar, the annual fee, from the amount of the award.

Premium will be divided pro rata among all the entries commended by the judges, according to the comparative merit of each as a commercial fruit. Premium $25.

LATE WINTER SEEDLINGS.—Same conditions as for early winter variety except that if found necessary the fruit shown may be retained and final decision reserved till later in the winter. Premium $50.

Horticultural Hall, Minnesota State Fair, 1902. View taken from Center of Hall, showing the East Half

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LANDSCAPE ADORNMENT A UNIVERSAL OBLIGATION.

JONATHAN FREEMAN, AUSTIN.

This subject when assigned to me was not accepted for consideration because I consider myself an expert professionally in this line, or because my environment in life has been such that I have been enabled to largely illustrate in my own surroundings, as a farmer, the truth of the above assertion, in which I certainly firmly believe. My childhood was spent on the old homestead, in one of the beautiful valleys of the Catskills. How vividly I recall the enjoyment received, from my earliest remembrance, in gazing upon many of Dame Nature's adornments, as illustrated by the entrancing sunrise over Overlook Mountain, now a much frequented resort; the bewildering beauty in spring of the changing, emerald shades in the foliage which gradually clothed the maple, beech, birch and other trees on the sides of the mountains that surrounded our home valley (one by two miles) on the four sides; the gorgeous variety of colors of the same foliage in autumn, when nature's work for that season was completed; and then in the late fall, when arising in the morning after a night's rain in the valley, imagine the feelings of a boy, when he looked out upon the mountains glistening in the sun's rays, in dazzling white from the soft snow clinging to the pine, hemlock and other trees from which the foliage had not yet fallen! Since those early days I have seen considerable of Mother Earth's surface in her varied inequalities, as adorned according to her own laws, and also as adorned by the truly civilized man, following the havoc made by the uncivilized vandal, whether his color be white, black or red.

The arrangement of the home grounds comprises extent of lawn, number and variety of trees and shrubs, location of flower and foliage beds, driveways and paths, and rightful adjustment of

size, shape and color in the placing of the buildings. The same requisites are to be observed in locating churches, school-houses, town and society halls, country cemeteries and parks—the preserved pieces of natural and planted timber, keeping clear of dying trees and re-planting the open interstices; and, last but not least, in my opinion, the sowing to grasses and planting of the roadsides, with sufficient intervals between trees to avoid snow drifting in winter and mud in summer.

Imagine the roadsides embellished with rows of alternating trees, consisting of the apple, the cherry, the plum, the evergreen, the larch, the maple, the elm, the ash, the basswood, etc., thus forming avenues of beauty and utility, and providing living posts for fences when considered necessary.

Mr. Loudon writes: "On the continent, and more especially in Germany and Switzerland, the cherry is much used as a road-side tree. In Moravia, the road from Brunn to Olmutz passes through such an avenue, extending upwards of sixty miles in length, and we traveled for several days through almost one continuous avenue of cherry trees, from Shasburg by a circuitous route to Munich. These avenues in Germany are planted by the respective governments, not only for shading the traveler, but in order that the poor pedestrian may obtain refreshment on his journey."

How often we who have fruit growing near the highway are thoroughly tried by the petty depredations of the youth who pass or live in the neighborhood. But how can we wonder, knowing that their home premises lack fruit of any kind, either from inability to furnish it or from the want of interest by their parents in the best welfare of their children.

When and where the above suggestions have been carried out, to a lesser or greater extent, whether by the rich or the middle class, what has been the effect upon the citizens of such localities, as are recorded in history and noted by experience? We find that the poor Indian in his barbarism was led to adore the Great Spirit by gazing upon the picturesque beauty of nature in its primeval simplicity. The same is known to be true of savages of all climes and surroundings. How many times greater, then, the appreciation by and influence upon such men as John Burroughs and John Muir! And how elevating and ennobling to those, who, by birth, surroundings and teaching, are enabled to appreciate and incorporate within their own being the beauty and grandeur of nature, which they are enabled to place before us, through their burning words, proceeding from enthusiastic enjoyment of scenery, perceived by the sense of sight!

Turn your attention now to the slums of the great cities, and learn, from the writings and efforts of Jacob A. Riis and others, of the present and resulting influence of the daily sight of a small piece of land free from stone, brick and wood, and having a few flowers and shrubs planted therein. Think of the temporary escape from heat, furnished the poor for an hour on a summer's evening, by providing a long, narrow dock extending into the water; of a day's ride up and down the Hudson river, between beautiful shores, adorned both by man and the Creator; and then perhaps, for the few, the privilege of spending two entire weeks at a country home. Ask the participants, both the old and the young, and what do they say? Observe, and how do they act? We *all know,* without amplifying. It is all for *good* and that *alone.*

Come with me now to the country with its villages and hamlets. The country and village families have not, to the same extent, the intellectual, social, moral and religious advantages as are near at hand and nearly free of expense to the families of the large towns and cities. Hence, as farmers, if possible, we must balance this shortage with improved opportunities of another character, which, we believe, can be more than met by landscape adornment

Among my earliest recollections, are the pleasures and recreation enjoyed *under* and *in* my father's and grandfather's fruit trees, of varied kinds, and in the adjoining forests, gathering the beechnuts, walnuts and butternuts, and following the winding stream of pure, clear water that meandered for a mile or more through the farm. It is a universal fact that children *naturally* love the beautiful, and we well know its influence throughout childhood, in contrast with the effect of its absence and the baneful effect of ugliness, disorder and dirt. Numerous proofs could be given, if the limits of this paper permitted, that landscape adornment has a wonderful bearing in building up a noble, unselfish and useful manhood and womanhood. Doubtless, those in my presence could rehearse instances within their own knowledge confirming the above assertion, that would require the time of the several sessions of the day for the telling. The writer assuredly believes that the privilege of looking, from the earliest remembrance, upon the beauties of a decorated prairie landscape, with the opportunity of partaking of the luxuries that go therewith, will greatly tend to enlarge the sympathy and interest of the participant for his fellow-man, and impel to renewed and continued efforts for the welfare of all of God's creatures.

Realizing from our own experience, observation and history that beauty and picturesqueness in all of our surroundings have an

extended and beneficial influence upon our lives, from our earliest days 'till we are called thence, and through our labors, examples and efforts upon others, we must readily acknowledge that landscape adornment *is* a universal obligation. This, of course, is required of each person according to his strength, ability and special liking. As in other directions in life, our tastes in landscape decoration will vary widely, as illustrated upon our individual premises; hence, some of us, who may be rather conservative or obstinate, must beware that we do not too strongly criticize the methods of our neighbors. The one who must earn every dollar that he possesses, perhaps, amid many drawbacks, cannot rightfully be expected to enter into the good work as extensively as the one abundantly prospered in this world's goods. Again, we should strive to thus inculcate these truths into the minds of the general public, that the more extended work of landscape adornment *shall be done* by the *township,* the *county,* the *state* and the *nation.*

Mr. Frank Yahnke: I am sorry to notice in this western state that our roadsides are really in very bad shape in a good many places. I enjoyed this paper very much, and especially so the portion in which he advocated for this country the planting of useful trees along our roadsides. I still enjoy taking my memory back to my youth, when I saw the cherries growing that Mr. Freeman spoke of. In the center of the town there was a crossing of roads where they had planted cherry trees that grew about sixty feet high. The cherry trees were rented to a certain man, and he would pick the cherries. The township got a good income from those trees alone. Anybody could take all the fruit that fell upon the ground, but they could pick none from the tree. It was in the contract that the man could punish anybody for picking any cherries but those that lay on the ground. The cherries that were very high in the tree were left for the boys to pick, and you may imagine what good use the boys made of them. They always tried their trousers to see whether they were made of good stuff. We enjoyed picking and eating those nice cherries. If we could plant cherry trees along our roadsides we could do nothing better. Cherry trees do not break down so easily as plum or apple trees. A cherry limb will bend, but it will not break easily.

RELATIONSHIP OF THE HONEY BEE TO HORTICULTURE.

F. A. TICKNOR

(So. Minn. Hort. Society.)

I find but one important, direct relationship between the bee and horticulture, and that is *fertilization,* but there are many mutual advantages existing in the dual occupation. The orchards furnish shade, low lighting places for swarms, a contented home for the bees, and it gives great pleasure for the manager or owner to hear the industrious hum of the busy workers among the trees, knowing full well that, like national banking, there is double profit coming from his investment, and that the little workers are also looking after the interests of his neighbors' blossoms for several miles around.

Were I to be dispossessed of the savings of many years both in business and productive life, and the choice was given to me either to become a burden on my friends or the public or on the other hand to commence life anew at an advanced age, I would at once decide to return to my old time occupation and first love as an apiarist. In connection with horticulture there is, to my mind, no pursuit in the productive lists fitted for young or for old, male or female, that requires so little capital and gives so large an opportunity for gain without the aid of power, expensive buildings, hired labor, etc., as the orchard and apiary.

In this paper I speak particularly upon the advantages of the apiary, making some very high estimates of what should be the results reached in it. The vital point of how to reach these high results is another question and could not be covered in one article or indeed in a dozen. It would be a very poor and exceptional year when less than one hundred pounds of surplus honey was received as an average of spring counts, and it would not be surprising to receive two hundred pounds average with the up-to-date way of applying human aid in conjunction with the efforts of the little bees—thus equalling the profits of a dairy cow. How to accomplish this is the point I wish to make in this article and the principle will apply equally well in horticulture.

Could I have a class of say not less than twenty students, young or old, to meet me once each week in the apiary from the time the bees were set out in the spring to the time that they were again returned to winter quarters, such necessary information and practice could be received as to enable them to obtain the results I have

named, and an experience would be gone through which otherwise would be gained only by many years of individual effort without such actual and practical instructions. I know that it is a popular notion today that our children must be passed through many courses of book knowledge, and whatever I might say against many of these unproductive branches of this so-called "higher education" would be received with disapproval by many who may listen to this article. However, although the graduates may have diplomas to burn, they will be all "vanity and vexation of spirit" so far as conducting a successful apiary.

I quote two verses from Saxe on the Queen's visit to Solomon:

"The windows opened at the king's command,
Within the room the eager insects flew,
And so the king and all his courtiers knew
That wreath was Nature's; and the baffled queen
Returned to tell the wonders she had seen.

"My story teaches (every tale should bear
A fitting moral) in trifles light as air
Some useful lesson to enrich the mind,
Some truth designed to profit or to please,
As Israel's king learned wisdom from the bees."

There is a mine of wealth, pleasure and instruction as well as an unfolding of God's plans and purposes in these occupations, but unless we use these advantages along thorough and practical lines we can expect but meager results.

"When Spring with warm and balmy air
Dresses the fruit trees in summer clothes,
Man's soul aspires to do and dare
For better things his heart o'erflows.

"On every side the fragrant flower
Bursts out to mantle winter's wreck,
And, Heaven—endowed with fertilizing power,
The honey bee is always first on deck."

ROTATION OF CROPS IN THE VEGETABLE GARDEN.

W. G. BEARDSLEY, CAMDEN PLACE.

For annual crops, such as potatoes, corn, pumpkins or squash, manure for potatoes and follow with sweet corn—sweet corn is considered a crop that draws hard on the soil; pumpkins or squash will follow very well after potatoes, with manure in the hill.

For summer crops in the garden, commencing with spinach, set onions, radishes, lettuce and peas. Spinach is sowed as a first crop on ground that is well manured and can be followed with beets, carrots, melons or cucumbers for pickles.

Radishes can be raised one crop after another the season through, for market. To have some ready for sale all the time they should be sown every ten days. Radishes will be large enough for market in twenty-five to thirty days, and by going twice over the bed you get nearly all the crop that is salable.

You can follow onion sets with tomatoes or rutabagas. If onions are a little late pull every fifth row and put in your tomato plants.

Rutabagas can be sown as late as the first of July. Beets or carrots will make a late crop, if sown bv the first of July or even by the middle.

Peas. The early varieties can be followed with rutabagas. I have in my mind now a neighbor that makes a nice thing out of rutabagas sowed after his early peas. An early variety of sweet corn, after the later crop of peas, will make a good crop of fodder, and if not planted too thick it will make very good ears, and it makes the best of fodder for the Jersey cow. The blue top white globe turnip can be sown after peas. They can be sown as late as the 24th of July and make a good crop.

Cabbage is a good autumn crop and with ground well manured with cow manure is a good crop to raise.

These suggestions are made in due faith that the season is favorable; sometimes it is very hard to grade crops to suit the dry weather, and the months of June and July are susceptible of dry or wet weather.

Mr. O. M. Lord: I would like to ask a question. I had a very fine crop of rutabagas, but they were so bitter they were entirely unmarketable.

Mr. Beardsley: My opinion is you planted them too early.

Mr. Lord: What time should they be planted?

Mr. Beardsley: The last of May to the first of June.

Mr. Wyman Elliot: I think if Mr. Lord had put his turnips on new ground he would have had a better quality. Old ground

is apt to produce strong turnips, unless the soil is specially prepared for the crop. In his paper Mr. Beardsley spoke of putting in turnips after peas; putting turnips in after potatoes is just as applicable. This year we had a crop of early potatoes, and we dug them, I think, about the 15th of July; then we seeded the ground to the purple top turnip and rutabagas, and the seed lay in the ground almost up to the first of September before it germinated, and then it came on and made a fine crop. Ordinarily turnips will come up in a few days and start right off growing. A difference of two or three days in the sowing of seed of any crop will make a vast difference. I have had considerable experience as a market gardener, and I find if I get my seed in just at the opportune time I can usually count on a good crop, but if I neglect to put it in within two or three days of that time I may have a loss.

Mr. Lord: I was at a great loss to know why they should be so rank. It was old cultivated ground; it had been in black raspberries for ten years, then I plowed them up and put in rutabagas. Tney made a very fine growth, and I thought they would be of a fine quality. I never tasted any so strong; we could not eat them at all. I did not know whether it was the character of the seed or the character of the soil. I was at a loss to find a reason.

Mr. Elliot: It was a lack of potash.

Mr. Frank Yahnke: The trouble with those turnips was that they got a good start, and when the dry weather came they stopped growing, but when the conditions were more favorable they made a second growth, and that caused that rank taste.

Mr. J. S. Parks: The saying is that "one side is good until the other side is told." It has been remarked that old soil is not as good for turnips as new soil. A case in practice comes to my mind. This morning I ate some of the finest rutabaga turnips I ever tasted in this city, and I made the remark that they were extra nice. They said the reason for that was that they had been grown on old soil. Where my brother-in-law bought them they had some grown on new soil and on old soil, and those that had been grown on new soil were ten cents per bushel cheaper than those grown on old soil. (Laughter.)

Mr. Jno. Freeman: I have for years sowed the strap-leaved turnip in my oats for fall feeding. They were sown the first part of May and sprouted well, and then this fall there came a dry spell, and they stood still, and some of them died. After the rains those that lived grew, and we have never eaten finer turnips or sweeter. Those strap-leaved turnips grew from three to ten inches in diameter.

The President: The best success I ever had in getting good, nice and tender turnips without a bad taste or a strong smell I got by making them grow just as fast as possible.

Mrs. J. O. Weld: My husband is not present, so I will just speak a word for his turnips. He broke a piece of new land and raised seventy bushels of turnips, and they were the best turnips I ever tasted.

Mr. Lord: What some said in relation to the rapid growth was just the reason I was so disappointed. They made such an excellent growth I thought they would be extra fine. I am still in the dark. Oakland county, Michigan, has been settled since 1835, and they are shipping thousands of barrels of rutabagas down the Ohio river. I would call that old land that they are raised on. I might, perhaps, explain that they have the best success in growing their rutabagas after clover.

Mr. Yahnke: The best turnips I ever saw growing were transplanted just like late cabbage. I have seen turnips grow as large as a half bushel measure. I have seen from ten to twenty acres raised in that way. They were planted mostly on old meadows, and they were the biggest crop of rutabagas I ever saw growing. They grew very fast, too. The seed was sown early and then they were transplanted; they were treated just like cabbage.

Mr. A. J. Philips (Wis.): I want to say a word in behalf of Brother Elliot—I like him pretty well, anyway. We, in Wisconsin, think there is no place in the world that will grow as good a crop of turnips as a new piece of land, but the trouble with Lord's land was it was too rich. An old raspberry bed is entirely too rich.

TRANSPLANTING THE APPLE IN THE NORTHWEST.

A. W. LATHAM, SEC'Y.

In preparing a paper of the above title the writer found it expedient to supplement his knowledge of the subject, which was somewhat limited, by that of a number of others of much broader experience. A list of eleven questions was sent to seventeen of the most experienced orchardists in the northwest, and a compilation of the replies of sixteen of them was made for use in the paper referred. The seventeenth set of replies had not been received at the time the compilation was made, though it is included in the lists as published below. The practical value of these replies reaches, however, much beyond the scope of that paper, and it impresses itself upon the writer as an obligation in the position he occupies to the society that they should be given in full for the use of its members. They have accordingly been rearranged by grouping together the various replies to each question, each reply being indicated by a letter of the alphabet, instead of giving the name of the person making it. For instance, all the replies preceded by the letter "a" are by the same person, etc. The list of those who kindly furnished these answers is in the hands of the secretary, but for various reasons it is thought best not to attach them to this article—firstly, because they were not asked for for publication. Following these lists is an ex-

tract from the paper referred to containing in part an analysis of them, which is submitted as a sort of suggestive guide to the fuller study they certainly merit.

1. *Question:* What is the best slope for an apple orchard?

Answers:

a. Northern or northeastern.
b. East and north.
c. North.
d. North and east.
e. Northerly.
f. Northeast.
g. Northeast.
h. 1st, northeast; 2d, northwest; 3d, on top of high rolling ground.
i. Northerly and northwesterly.
j. Northeast.
k. Northeast.
l. Northeast, one foot descent to the rod.
m. North—set an orchard for ourselves last spring on south slope.
n. Northern—for the reason that there is more moisture.
o. Northeast, 1st; north, 2d; east, 3d; southeast, 4th; south, 5th; southwest, last and worst of all.
p. Northeast.
q. North or northeast.

2. *Question:* From what direction should the orchard receive protection?

Answers:

a. Southwest.
b. South and west.
c. West.
d. South and west.
e. South and west.
f. South and west.
g. North and west.
h. South and west, but far away to give good circulation of air.
i. From the south and east and from the direction from which the heavy winds come in the locality where the orchard is planted. (Not too close a windbreak, so as to prevent good ventilation.)
j. West and south.
k. South and west, principally from south.
l. From south and west.
m. South and west.
n. From south and west, as the prevailing hot winds dry out the ground and blow off the fruit.
o. South and southwest.
p. Southwest and west.
q. Direction of prevailing winds.

3. *Question:* Best soil and subsoil for the orchard?

Answers:

a. Clay loam—clay subsoil.

b. Any soil fit for corn with a clay subsoil.

c. Probably clay, but cultivation is more important.

d. Clay loams on high lands, with limestone foundation which retains water.

e. Clay or limestone subsoil; top soil of little moment.

f. Rich loam with a yellow clay subsoil.

g. Light clay loam with limestone subsoil.

h. Yellow clay loam with stiff clay subsoil, underlaid with lime rock, if possible, on ground not nearer than six feet of surface.

i. Clayey loam with a clay subsoil; if subsoil is hard have it broken up with a good subsoil plow.

j. Clay, with blue clay subsoil.

k. Rich black soil, with clay subsoil.

l. Sandy loam, clay subsoil one foot from the surface.

m. Clay loam, with open clay subsoil.

n. A good loam, with clay subsoil, is best, but I find I can make sand and clay work well.

o. Surface soil a rich, heavy soil, inclined to clay; subsoil much the same, but with enough sand to give drainage.

p. Clay loam, gravelly clay.

q. Clay loam, gravelly clay.

4. *Question:* Best time to dig the trees for the orchard?

ANSWERS:

a. Fall.

b. In spring as soon as the frost is out of the ground.

c. When the frost is out of the ground in spring.

d. When needed to plant. If dug in the fall, should be root-pruned and buried.

e. Fall in this climate.

f. As soon as weather will permit in the spring.

g. When ready to plant in spring.

h. Latter part of October or first of November, after one or two hard frosts to kill leaves, and all leaves stripped from trees before or at time of digging.

i. In the fall when dormant, just before the ground freezes up.

j. Fall.

k. In fall, late as practicable.

l. Dig in the fall. After a mild winter trees will do well dug in the spring.

m. Just before you set them, or when you can. Fall before setting is a good time.

n. I like a fall dug tree best.

o. Dig trees the last thing in the fall before freezing up, or soon after the leaves fall.

p. As early in fall as practicable after severe frost has checked growth.

q. In the fall.

5. *Question:* Best way to keep the trees till planting?

Answers:

a. Buried in soil.

b. Bury them deep enough in the ground so as to cover a part of the stem.

c. Roots should be always covered with moist earth.

d. Bury root and branch with earth in winter.

e. In root cellar or heeled in open ground. Have tried both ways extensively, and can discover no difference in the resulting thrift of the trees.

f. Heeled in.

g. In nursery row or well heeled in.

h. Bury them, roots two feet, tops six inches, and mulch well after covering with leaves, coarse manure, wild hay, corn stalks or sorghum bagasse.

i. Heel them in on well drained land. Cover the tops lightly with sod, and then put on a light cover of straw to hold the snow. Covering the tops is to prevent them from being dried out by winds —circulation of sap being cut off—when taken up.

j. Bury or heel in in cool cellar.

k. In cool cellar with roots packed in moss, if properly done; heeling in outside is all right if done right.

l. Heel in so that trees will not freeze and thaw, nor get too wet nor too dry.

m. Cool, damp, out-door cellar, or bury root and branch.

n. Either in a moist cellar or cover with earth when ground is frozen a few inches; cover heavily with coarse manure to prevent frost going down to the trees.

o. Dig a trench about two feet deep at the lower end (if only a few trees) sloping up from the bottom to the surface. Place the roots to the north or northeast, so when time to uncover raise the tops pointing to the sun. Uncover tops first and keep tops shaded till ready to set.

p. Buried in sandy soil.

q. Heeled in.

6. *Question:* Best time in spring to plant the orchard?

Answers:

a. As early as ground will work.

b. As early in the spring as the ground is in a good condition to be worked.

c. As soon as the frost is out of the ground.

d. As early as the soil can be worked with good results.

e. As the buds are beginning to swell on the orchard trees.

f. As soon as soil will work well.

g. As soon as ground is in good condition to work.

h. April 20 to May 10, depending on earliness of season.

i. As early as the ground can be worked and not leave it in condition to be baked by the sun.

j. When ground gets warm enough for corn.

k. As early as the ground is in good condition to work, or as soon as spring has fairly opened.

l. April 20th.
m. When the frost is out of the ground so you can dig deep.
n. Early in spring.
o. The first days of May, or in early corn planting.
p. As early as ground is warm and dry.
q. As soon as ground can be worked.

7. *Question:* Best size of trees for planting in orchard?

Answers:

a. Four to six feet.
b. Between four and six feet.
c. Two or three years old.
d. Good, thrifty, three-year-old apple trees. Plum trees may be planted younger.
e. If well handled, five to seven-foot trees; if carelessly handled, the smaller the better, down to zero.
f. Three-year-old, five to six feet high.
g. Two-year-olds, four to six feet.
h. Two years, if for a young man; three years for a middle-aged man, and four years for an old man past seventy years of age.
i. Thrifty two-year-old trees, three-fourths to one inch in diameter of stock at the ground. Have tried one-year-old trees without success.
j. For general planting, five to seven feet, but this is immaterial if stock be thrifty and given good care.
k. Four to six feet high.
l. I prefer a four or five foot tree.
m. Have had good luck with very large trees six to eight feet—just as good as with smaller trees.
n. Eleven-sixteenths to three-fourths inch tree, five to six feet high.
o. Would prefer two and three-year-olds, but would not seriously object to four or even five years, if properly cared for in digging, handling and setting.
p. One year from root graft.
q. Two-year, or, at most, three-year trees.

8. *Questions:* Best method of propagating trees for the orchard?

Answers:

a. Root-grafting.
b. Root-grafting.
c. Six-inch scions on four-inch roots.
d. Graft on hardy roots or top-work on vigorous, hardy stocks.
e. To the best of our *certain* knowledge to the present time, by piece root-grafting, using a good long scion and moderate length of root.
f. Root-graft; short root and long scion.
g. Root-grafts for this country; long scion and short root.
h. 1st, grafting at the crown of roots, with whole roots for stock; 2d, grafting on short piece root with five-inch cion.

i. Have always used grafted trees; have had no experience with those budded.

j. Crown or whole root-graft.

k. By piece root-grafting.

l. I think root-grafting all right.

m. Root-grafts.

n. Root-grafting on crab stock.

o. Grow first on hardy roots, or on trees like Hibernal or Virginia crab grown on their own roots. Then set and grow the trees about two or three years. Then top-work them with fairly well-tested kinds.

p. Root-graft.

q. Crown-grafting one-year seedlings from selected seed of hardy trees.

9. *Question:* How should roots be pruned before planting in orchard?

Answers:

a. Cut from the under side all bruised or broken roots and the ends of the roots. Smooth off to fresh wood.

b. Cut them back to the length of eighteen inches, and when the roots are injured in digging, cut them smooth.

c. Only where broken.

d. With slanting cut made from under side of roots.

e. No more than enough to make smooth cuts at the ends of the roots, and to fit the roots to a generous sized hole.

f. All broken roots cut smoothly.

g. Cut off ends of bruised roots only.

h. Depends on the size of tree and root. Two years, trim all roots back to six inches; three-year-trees, trim to ten inches; four-year-trees, leave all the roots possible, with the end of root cut from under side sloping out.

i. Do all pruning in fall when the trees are heeled in. Cut off all rough ends and let the cuts be from under side upward, so that when the tree stands up no cuts are shown. Roots will be well calloused by spring.

j. Should cut away damaged portions only.

k. Cut ends smooth.

l. Set trees with roots left on, and in as fresh condition as possible. If much dried, I bury in moist earth for three or four days, root and branch.

m. Cut off the bruised ends with sharp knife.

n. It does not matter so much; but it is well to cut off ends of roots and any that are broken, but roots are supposed to be in good condition.

o. Cut off all bruised roots, all small fibrous roots and all roots that are injured on the ends back to where they are entirely sound. If too long to be straight in the hole, cut off. Cut all roots from the under side.

p. Cut smooth and shortened to not more than ten inches.

q. Cut off all bruised and broken roots and the tip ends of all roots.

10. *Question:* How should top of tree for orchard planting be pruned?

Answers:

a. As a rule we take off all unnecessary limbs that grow toward the middle of the top, and about one-half of the last year's growth; this should be varied to balance the loss of root.

b. In young trees, cut out as many of the branches as will give the tree a good top.

c. So as to leave limbs in proper shape.

d. By pinching off terminals or light pruning where limbs cross.

e. Leave central stem intact; prune all other branches to the extent of one-half of previous season's growth.

f. Cut back about one-half of last year's growth.

g. If trees have been properly trimmed in nursery, they will need very little when setting out.

h. Two-year trees, three to five limbs three inches to five inches long; three-year-trees, three to five limbs two inches to five inches long; four-year-trees, trim all limbs of last year's growth to two strong buds, and all surplus growths entirely away.

i. Pruned in fall (when roots are pruned). Reduce the top in same proportion that the root system has been reduced. Always leave a smooth, clean cut.

j. Would cut back about one-half last season's growth.

k. Head back all side limbs about one-half and leader or top but little.

l. Cut back two-thirds of last year's growth, waxing the tips.

m. Cut off half of last season's growth.

n. Cut back to about one-third of the limbs.

o. Heighth of stem, from two and one-half to three feet. When my tree is set with branches the heaviest on the sun side, I take off any and all remaining branches that are on the northeast side close to the trunk. I head in or clip the twigs on the sun side, especially if there are openings to be closed up on that side.

p. Merely cut back two-thirds of last year's growth.

q. To symmetrical shape, leaving no crotches.

11. *Question:* How deep should trees be planted in the orchard?

Answers:

a. From four to eight inches deeper than they stood in nursery.

b. From three to six inches deeper than they stood in the nursery.

c. Six inches, at least, deeper than before.

d. Four to ten inches deeper than grown in the nursery, depending on soil conditions. The deep-planted fruit trees are most permanent and desirable. This saves root-killing, so frequent in northern orchards.

e. About six inches deeper than they stood in the nursery.

f. About three inches deeper than they stood in nursery.

g. Four to six inches deeper than they grew in nursery.

h. This depends on location and soil. Very high rolling or

steep hillsides, 12 inches to 18 inches to top of root; on lowland ground, six inches to twelve inches deep and ground raised around tree 4 inches to 6 inches when finished.

i. Four or five inches deeper than they stood in the nursery. If the soil is very heavy and slow in drying out in spring, would set but three inches deeper.

j. For five to seven-foot tree, would plant about six inches deeper than they stood in nursery.

k. On a wet soil, plant shallow; if very wet, set tree on a little mound; on our dry soils in South Dakota, we usually set tree four to six inches deeper than it grew in nursery.

l. Plant four inches deeper than trees stood in nursery; then work soil towards the tree in cultivating.

m. At least twelve inches deeper than they grew in nursery if set on dry ground. We have the best luck where holes are dug two feet deep and set very firm around the roots, looser on top. The tree does not shake around with the wind when set deep.

n. In most places the soil is dry, and trees should be planted twelve inches deeper than they stood in the nursery row, and the holes should be dug three feet deep with a depression of twelve inches at the tree.

o. I set trees from seven to fourteen inches deeper than grown in nursery. In heavy, cold, retentive soils three inches is enough.

p. One inch deeper than it grew in the nursery.

q. Four to six inches deeper than grown in the nursery.

In order to get the exact thought in some of the foregoing replies, it will be necessary to read them also by letter. For instance, read all of letter "a" consecutively, commencing with the reply to question "1"; then read all of "b," etc.

"Of the sixteen preparing these replies, seven were nurserymen as well as orchardists, but, in examining the replies, with the single exception of the size of the trees to be planted, I am unable to differentiate between those who are nurserymen and those who are not.

"The first question the proposed orchard planter asks is as to 'where' the orchard shall be located. The general reply to this subject in the northwest has been heretofore: 'north slope upon elevated ground,' and this voices somewhat my own experience. But I was a little surprised as well as interested to know that of the sixteen replies to the query as to the best slope for an apple orchard, only four recommended a north slope, while eleven noted a preference for a northeast or north and east slope, and only one a north and northwesterly one. In an experience covering many years with a vineyard which has been especially successful in growing a very fine quality of grapes, I am led to believe that the northeast slope is the best even for that purpose, as the vineyard referred to stood exactly upon that kind of an incline. It seems to be very definitely settled, then, for Minnesota, at least, in the judgment of many of those best qualified to speak, that a northeast slope is to be preferred for an orchard.

"In intimate connection with this is the second query, referring to the exposure and necessary protection for the orchard location. From which direction should this protection come? Here, too, the majority of the replies received were somewhat at variance with what I had supposed to be the general opinion on this subject, and out of the sixteen ten declared directly for protection on the south and west; two others on what is practically the same protection, one for south and southwest and another for southwest and south; one preferred south and east protection, and only one a protection from the northwest. From each there is a general thought that the orchard should have protection. One of the replies struck the key note, I believe, in asking for protection from the direction of the prevailing winds, and whether this was in the thought of the writers of these replies or not, it seems that much the larger proportion of them ask for protection from the southwest winds, which are so damaging to the orchard from their dryness, and also a location on a slope to the northeast, which is virtually also another protection interposed in the direction of the prevailing winds by the elevation of land upon which the chosen slope is located.

"As to the soil preferable for an orchard, there is but little disagreement. Twelve of the sixteen definitely ask for clay or clay loam, though one or two speak of it as a rich loam or a good loam, and one as soil fit for corn. For the subsoil there is equally a general preference for a clay subsoil; three asking also for a subsoil going down to limestone rock; two preferring gravelly clay; one open clay; two sandy clay; all of these selections being made evidently for the purpose of securing good drainage. The evident motive underlying these replies is for a soil which is not only fertile in the elements required for the growth of a tree, but is also especially retentive of moisture,—and indeed the whole purport of these replies is in the direction of securing and retaining sufficient moisture, both by a suitable soil and by a location sloping away from the direction of the prevailing summer winds and protected also from the same quarter.

"The preparation of the soil I will touch upon only briefly in saying, that in a clay soil it would undoubtedly be wise to use the subsoil plow if possible a year before planting the orchard, so that the soil may subside to a sufficient degree of solidity, and, following the same principle, the surface soil should be deeply plowed the fall before planting, taking it for granted now the planting in any case in this latitude will be done in the spring. Lighter soils of course do not need this deep treatment, but if it can be avoided an orchard should not be located on a light soil.

"The brings us to the question of the best time to dig and transplant the trees that are to constitute our orchard. Of the sixteen replies received in answer to the question as to the best time to dig the trees, ten without conditions agree upon the fall, of which four express a preference for late in the fall and one for 'as early in the fall as practicable after the frost has checked the growth.' Four express a preference for digging trees in the spring as soon as the frost is out of the ground. Of these, two express a preference for planting in the spring; it is probable that they may have these trees

on their own grounds and this fact has a bearing upon their preference. The large majority, however, prefer the fall digging, and this view agrees with my own experience, aside from the convenient opportunity that may come to a planter who has trees upon his own place and can remove them and transplant at once without delay.

"Following naturally upon the practice of digging trees in the fall is that of caring for them through the winter. The replies to this question are divided between the cellar and burying out of doors, depending probably upon whether or not the cellar at hand is suitable for keeping trees. Eight speak of burying them all over, root and branch; six only speak of heeling them in, but it is fair to presume that the thought here is also the same, that is, to bury them and cover them entirely; one calls attention to burying them in sandy soil, but says nothing about mulching them after so burying, which, would, of course, be absolutely necessary to insure safe keeping. A number speak of using this mulch over the covering of earth, and it should by no means be neglected. With the trees sufficiently buried and carried through until the following spring, we have arrived at the problem of planting.

"At what time in the spring should the orchardist in the northwest set out his tree? On this subject there is not very much disagreement, early spring or as soon as the ground can be worked being the very general conclusion of those who have considered this question, ten of the sixteen responding in almost these exact words. One fixes it definitely at April 20th, and another at from April 20th to May 10th. There are four of the sixteen, however, one-quarter of the number, who have evidently another thought on this subject, as they take the position that the ground should be warm before planting, two of them referring to it in this way and one carrying the thought in recommending 'early corn planting time;' another 'as the buds begin to swell on the orchard trees.' In my own practice I have had the best of success in planting about the time referred to as 'early corn planting time,' and if the trees are on one's own ground they may perhaps be dug and transplanted with some success even after the leaves are beginning to start a little, but it is undoubtedly better that the trees, unless dug the fall before, should at least be dug and heeled in very early in the spring, when the question of planting either quite early or a little later may be one of convenience.

"Having considered, then, the subject of time of planting, we may next decide upon the character of the tree to be used. What shall be its size, age and method of propagation? The sources of information I have used agree in the use of a root-grafted tree, though they diverge a little here as to the method of its making. One speaks of grafting on hardy roots,—upon this point, however, certainly all are agreed. Two would create this orchard tree by top-working it. Three would use whole roots and graft in the crown. Six speak specifically of using a long scion and short root. The majority, however, as it appears, do not lay stress upon this point.

"As to the age and size of the tree there is considerable divergence within a limited range, one only of the sixteen expressing a preference for a tree one year old; eleven, however, would plant a

two-year tree and fourteen a three-year-old tree; two are equally willing to plant trees four years old, and both of these are planters of large experience. This list aggregates more than the sixteen, which is the result of a preference expressed by a number for trees two or three years old. It will be seen here that there is a larger preference for trees three years old than any other age, and this arises from the fact that the nurserymen in the list stand pretty well together for the three-year-old trees; four to seven feet being the range within which they agree.

"I find there is some disagreement in the replies received to the question in regard to top-pruning. A number express an opinion indicating that the pruning should be sufficient to secure a good shaped top, but the writer may have understood the question to apply in a general way to pruning the tops of trees and not especially connected with transplanting. Four would prune away one-half of the length of the branches, leaving the central shaft, or shoot, entire; two would cut off two-thirds of the length of the branches, and one, one-third. One expresses his judgment to 'reduce the top the same as the root,' and this, it seems to me, is the logical thought. Space is too limited to go into detail here as some of the writers have done, though they agree fairly well, it seems to me, that one-half of the new growth should be taken from the tree at the time of transplanting.

"A good deal has been said and some experimenting done late years along the line of close root-pruning for transplanted trees. I find a very general agreement among planters of note, not only in the northwest, but all over the country, in leaving the root of as good a length as can be conveniently dug, and I judge the length of root as left by the ordinary nurseryman using the tree digger to be in the main satisfactory to planters. One writer, it seems to me, voices the general sentiment fairly in saying that two-year trees should have the roots trimmed back to six inches, and three-year trees to twelve inches, and larger ones in proportion. Sir John Evelyn, the old English writer referred to above, seems to have considered this subject with much care when he says that 'the main point is to see that the root be larger than the head.' My correspondents, while they say nothing on the subject of close root pruning, almost uniformly agree that the injured roots should be pruned off smoothly with a slanting cut from the inside, and five speak of having smooth cuts on all ends; a number speak of the length of the roots of three-year-old trees ranging from ten to eighteen inches. It is probably wise to trim off injured roots in this way, although it is possible that planters generally are mistaken in believing that roots as a rule grow from the callus which forms over these cuts; at least Prof. Bailey says, as a result of his experience, that 'the roots do not necessarily arise from the callus.'

"Having now secured our tree and agreed upon other conditions connected with the planting, we shall proceed to set it, and this brings up a question upon which the planters in the northwest are, it seems, very fairly agreed, although they are somewhat at variance with recognized authorities. How deep shall the tree be planted?

My own practice, which, however, dates back twenty or more years, has been always to set the tree so that when the ground settled it would stand an inch or so deeper than it stood in the nursery. As far as I know, the results of this method of planting have been satisfactory. Charles Downing says: 'No tree should be placed deeper than it formerly grew.' Hooper, in his Western Fruit Book, says: 'Plant the tree at the same depth that it previously occupied in the soil.' Sir John Evelyn says: 'Plant not too deep, for the overturf is always richer than the next mold.' Coming down to later authorities, Prof. Bailey says: 'Trees should be set an inch or two deeper than they stood in the nursery, for the loose earth will settle and wash away during the course of the season, even if well packed when trees are set.' Getting nearer home, Prof. Samuel B. Green says: 'In the best locations trees should be set about four inches deeper than they grew in the nursery.' The sixteen experienced planters whose judgment I appealed to on this subject almost uniformly agree upon what is now called deep planting, and as this is such an important question, I will give you their replies in detail. One would plant one inch deeper than in the nursery; one, three inches deeper; one, four inches deeper; one, from three to six inches deeper; one, from four to five; four, from four to six; three, six inches; one, four to ten inches; one, five to seven inches; and two, twelve inches deeper. Of the sixteen you will perceive that ten of them range from four to seven inches deeper in planting. From comments that appear in connection with these replies, I am led to believe that the purpose of this deep planting is to prevent the drying out of the trees. What surprises me in these answers is that while a number speak of the necessity for deep planting on account of possible drought, not one refers to the advantage of deep planting as resulting in a growth of roots from the scion. This thought is evidently not so much in mind as the former, though I have often heard it expressed elsewhere.

"It is hardly necessary to say that in planting the orchard tree a hole should be dug at least large enough to take in the roots without bending them, and the ground should not be too moist to crumble easily. The earth should be carefully worked in amongst the roots with the hand and the ground pressed or stamped down about the roots as the planting proceeds. If too dry it may be necessary to pour in some water before the final filling in of the hole; but no water should be put on after the hole is finally filled up, and the top soil should be left loose. For the sake of conserving the moisture in the ground the surface about the tree should be well mulched with suitable material or cultivated faithfully from the start. There is a variance in the methods of planters in regard to the way the surface of the ground should be left after planting. The writers of books covering this subject disagree somewhat with northwestern planters. A number of writers speak of the necessity of leaving the ground a little higher about the trees than the general surface, and in many cases accompany this direction with the suggestion that it is especially necessary in the fall, that the water may not stand about the trees.

"In a general review of the subject of this essay, noting the variation from the practices of recognized writers on horticulture that are being practiced by northwestern planters, as represented in the sixteen whose views I have quoted you, it is apparent that Prof. Goff has struck the key note when he says 'an adequate supply of water is the most important condition for the well-being of plants,' and that these variations are the result of a recognition of the fact that the water problem is the orchard problem of the northwest. This undoubtedly does not apply so much to all parts of Wisconsin as it does to Minnesota and the Dakotas. The selection of a northeast slope; the insistence of protection from the southwest; the necessity of digging and burying in the fall the trees to be planted the following spring, rather than leaving them out to be weakened and destroyed by the drying winter winds; the deep planting, sometimes even in deep furrows, and, finally, the necessity of mulching or continuous and most faithful cultivation; all these facts point to the prime necessity of guarding every process to insure a sufficient water supply which has been forced upon the planters of the northwest as a result of the dryness of our climate. This, it seems to the writer, is the great lesson that we have been learning in the last quarter century, and the recognition of which is placing orchard culture in this region upon a secure basis.

"These are rather rambling thoughts. In taking up the subject I had not in mind an essay on the conservation of moisture in orchard culture, but my investigations have naturally drifted this way. I leave this to you as my final thought, the orchard planter in the northwest will succeed directly in proportion as he shall use every means at his command to conserve the necessary amount of moisture, without which his orchard cannot possibly thrive.

Summary.

"Grouping together the opinions of those whose judgment has been invoked to supplement my own, as set forth in these notes, upon the few points connected with apple culture in orchard touched upon, we reach the following composite conclusions:

"1. Select a notheast slope for an orchard.

"2. Provide protection for the orchard from the direction of prevailing winds, usually from southwest.

"3. Select for the orchard a strong clay loam, with a subsoil of clay pervious to moisture.

"4. Dig the trees in the late fall and bury for the winter.

"5. Plant in the spring as early as the ground is in good condition to work.

"6. Plant trees three years old and four to six feet high.

"7. Prune the roots only as necessary to trim off all bruised ends, cutting from beneath outward.

"8. Prune away one-half of the new growth from the top.

"9. Plant the tree from four to six inches deeper than it stood in the nursery."

BUDDING AS A MEANS OF IMPROVING FRUITS.

R. S. MACKINTOSH, ST. ANTHONY PARK.

Budding is a form of grafting used at times when other styles of grafting cannot be used. It differs from ordinary grafting in that the scion has only one bud, and the work is done when the plant worked upon is growing vigorously.

In this region budding is not practiced as much as in the south and east, except perhaps in propagating plums. With the apple, root-grafting is preferable on account of the uncertainty of the hardiness of the seedling apple roots.

Budding has to be done at a time when the stock (*i. e.*, plant worked upon) is growing vigorously and when the outer bark peels easily. This is either in June or late July and August.

June Budding: In some cases budding is done using buds of the current season's growth. These start at once. In the north this is not done as much as in the south.

FIG. 1 —At work budding in the field. One to insert the buds and another to do the tieing.

Regular Budding: The plum is best budded in this section in July or August, or when the bark separates easily. The buds used are taken from well matured wood of the same season's growth. The twigs thus cut are called "bud sticks." The stocks used should not be less than three-eighths of an inch in diameter. The leaves are cut off near to the wood, which is then wrapped in a moist cloth to keep from drying out. The stocks are worked usually on the north

side and quite close to the ground. The north side is chosen to avoid the danger of their being dried out by the sun or by the dry south winds, that are frequent in this climate.

BUDDING—Illustrated.

(1.) Vertical and cross cuts made in stock.
(2.) Buds partly cut out.
(3.) Bud.
(4.) Bud pushed into stock.
(5.) Tied with raffia.
(6.) Stock cut off after bud has started. (This should not have been cut off until the bud had grown several feet high.)

Operation: The budder takes the position as shown in Fig. 1. He selects a place on the stocks near the ground and where the bark is healthy. With the rounded point of a sharp knife a slit about one and one half inches long is cut lengthwise of the stock. At the upper end a cut is made across this, as at (1) Fig. 2. The point of the knife is now inserted into the matrix to lift the bark from the wood. A bud is cut from one of the bud sticks by starting about one-half inch below the bud (2) and moving carefully under the bud and about three-fourths inch above it. The bud (3) should have enough bark and wood attached so that it is quite firm—not taking merely the bud alone. Holding the bud near the point of the knife, it is now pushed down its full length (4) firmly into the matrix. It is then (5) tied in place (see Fig. 1) with any convenient tying material, as cotton yarn, string or raffia. Raffia is one of the best tying materials. Cut it into convenient lengths (usually about twelve inches) and

moisten a little. In tying start below the bud and wrap continuously from the bottom to the top, only leaving the bud uncovered. Tie very tightly and securely, so that there will be no danger of any part of the bud not being in contact with the stock. To be successful the stock and buds should be healthy, and the inner barks of both stock and scion should be together and firmly held in place.

In about two weeks the work should be examined to see if the strings are too tight, and if so they should be loosened. When the buds are firmly attached the strings may be cut off entirely. This is done by cutting the tying materials on the side of the stock opposite to the bud.

No buds put in as just described should start until the following spring. In the late autumn earth should be put up against the buds to help protect them during the winter.

In the spring the stock is cut back to a point about six inches above the bud. This stub is left to protect the bud and to prevent the bud from being "drowned" with too much sap at first. Later the shoots that start from the stub are cut back. The shoot from the bud may be tied to this stub for a time to keep it from being broken by the wind. The following spring the stub should be cut off close to the young shoot.

Mr. J. S. Parks: Do you cut off the bud and take out all the wood?

Mr. Mackintosh: We do not think a little wood does any harm, and it takes quite a little time to take it out.

Mr. Taylor: I would like to ask whether that work can be done in the spring? I have been budding in the spring and getting two or three inches of growth the same season.

Mr. Mackintosh: It can be done the way Mr. Wilfert does it. If you have dormant buds it can be done in the early spring.

Mr. Taylor: I have taken buds that had started a growth and made one leaf, and yet they grew right along.

Mr. Elliot: Tell us why you cut the stock off four inches above the bud?

Mr. Mackintosh: If you cut it way back to the bud it would receive too much nourishment at once. It would be apt to drown it.

Mr. Elliot: But you have to keep the buds rubbed off?

Mr. Mackintosh: Yes. It is necessary to keep the buds rubbed off during the first season. The spring following the stub is cut off entirely.

Mr. Wedge: There are two points that Mr. Mackintosh made that are very valuable. I have never seen it done so nicely and so well illustrated as it has been done here. The cut is nearly always shown with the knife used above the bud. You are sure of a clean, nice cut below, and you have to be sure to leave a small bud. Do not try to cut the wood out under any circumstances, because in

trying to cut it out you will be almost sure to injure the bud. Better leave it in.

Mr. Elliot: I simply want to say a word to the younger members of the society. I have a young friend in the other room who has taken some premiums at the fair. I have tried to get him to take up budding and put it in practice on his place. Well, he says he doesn't know how. I got him a knife, made him a present of it, and I told him not to go home and say he couldn't do it. I said, "Take your knife and make an effort at it and see how many you can make grow." That is what I want to say to these younger members, try it and you will succeed eventually if you don't at first.

Mr. Taylor: The illustration shown has been on a small tree, but my budding is done on larger trees. When I have a tree that is undesirable or that does not give us fruit, instead of grafting I simply bud in the bend or in the joints of the limbs and I can change the nature of the tree in a few years so it will bear a different fruit. Instead of tying I simply tuck the end under, which saves the work of tying.

Mr. Lord: I invariably failed in trying to bud until Prof. Green came and gave me some information. I found I made a mistake in not tying sufficiently tight.

Prof. Hansen: I want to emphasize what Mr. Lord has said. There is not one man in ten who ties the bud tight enough, and if you do not watch a man all the time you can hardly get one to tie it tight enough.

Prof. Green: Budding is done in the school of agriculture in the winter. Instead of budding with a ripe bud we take the plants and put them in the cellar, and after the plants start into growth in the cellar a growth of three or four inches in length, we take these cions and use them for grafting and insert the buds under the bark. That is just what Mr. Taylor does. It is a very good way and is quite commonly practiced. You can bud the first of May, just at any time after the bud is started, and you will find it will make just as good a growth. Mr. Wilfert talked of sticking the cion under the bark, and when you stick that under the bark it is the same thing. It will work all right and work almost any time during the growth of the tree. There is a little difference in the detail.

Mr. C. H. True (Iowa): Will the cion that grows from the bud be sufficiently hardy in the fall?

Prof. Green: Yes, for all practical purposes it is all right.

Mr. Leach: Would you not wait until the bark loosens?

Prof. Green: Of course, you have to wait until the bark is loose; that is one of the first conditions.

Mr. True: In spring budding would you take the buds from the tree early and keep them dormant or take them ripe?

Prof. Green: In the case of plums I would rather take them from the tree, but with apples I would keep them in the cellar.

Mr. Mackintosh: A great many questions have been asked about raffia. It takes the place of basswood in some localities, and it is sold for twelve to twenty cents per pound. It is very strong and convenient to use; it is used a good deal.

Mr. Elliot: I want to give you a pointer on this raffia. It is a very good thing to use, but I can put you on to something that is just as good. You go to the woods in the month of May when the sap has started and cut down some basswood and stick it into the first pool or mud puddle, letting it remain eight or ten days, and then strip the bark off, and you will have something just as good as raffia.

Mr. Underwood: I came across a very interesting and, perhaps, a very valuable feature of budding to produce new varieties of fruit in California last winter. A man by the name of Thompson, who has produced there what is known as the "Thompson seedling," has made another valuable improvement by budding, and if I was correctly informed the Thompson seedling was produced in the same way. The navel orange, as you know, had its introduction in a commercial way at Riverside, California, and where it is most widely propagated the growers wanted something that would prolong the season. This Mr. Thompson went at in the same enthusiastic way we seem to do things here in Minnesota, by experimenting, and he found he could get an orange that had all the splendid characteristics of the Washington navel, being free from seeds, of good size, fine flavor and still a later keeping fruit. I cannot tell you the exact process he employed to produce that, but he now has one that he calls the "Navelencia," which is a cross of the Washington navel and the Valencia. The Valencia being a later variety he chose it to accomplish the result he desired. The process he uses is something very unique and something that everybody can try. I can vouch for its success, as I have stated the facts to you, and I cannot see why it cannot be used to produce late varieties of apples as well as oranges. It was explained to me by an enthusiastic and intelligent orange grower, who was a neighbor of Mr. Thompson, whom I did not have the pleasure of meeting. He takes, for example, the bud of the navel orange and one of the Valencia; he splits them in two and then unites one-half of each bud and inserts the united bud in the limb. The two unite in forming a new bud and a new branch, and from that a new tree and a new fruit. Now, if Mr. Thompson can do that with oranges why may we not do it with apples? I do not know; I may be entirely misinformed, or it may not be practicable with the apple, but I thought enough of the idea to set some buds the past summer of the apple in that way, and I am making an experiment. It does not cost anything, and if you can use it in any way to produce a new variety of apple I shall be glad I said something about it.

The President: Have they grown together?

Mr. Underwood: I think they have united and the indications are that they have made a perfect union. It remains to be seen whether they will produce a good branch.

Mr. Brand: Mr. Darwin mentions several instances, and one in particular, where an apple was red and sour and of a peculiar odor on one side, and sweet and yellow on the other side, and trees propagated from that tree retained the same characteristics. He thinks it was produced in the same way, by the union of one-half of two different varieties.

The President: I heard of that being practiced to some extent when I was a boy, fifty-five years ago, splitting buds, uniting one-half of each in the limb, binding them tightly, and it was said they would produce apples one-half of which would have the characteristics of the tree from which one-half the bud was taken and the other half would be like the other bud, or that the tree itself would be divided, that one-half would produce one kind and the other half another kind, but I said to myself if that were true we should have them everywhere. It has been fifty-five years since I heard that, but the method has not come into general use.

Mr. Gibbs: Any sort of a story that comes from California can be deemed credible after what Mr. Burbank has done. Our experiment stations are all keeping their eye on him, or, as the saying is, "watching his smoke." We should all do well to study what that man is doing in performing these wonders in producing new fruits.

Mr. H. V. Poore: I want to give the experience of an uncle of mine. The thought occurred to me that I might drop here a few remarks that might assist us in these root-grafting experiments. I think most of our choice fruits, such as apples, are chance productions produced, as Prof. Hansen has shown us, by cross fertilization. There are thousands of places in the state where there is no fruit of any kind. In my observations of the different varieties of plums and apples on the prairies, where they are so widely separated that there is no chance of cross fertilization, it occurred to me as a very good plan to isolate the best from other varieties and save the seed from those fruits, and with choice seeds we could make a thousand experiments of that kind, and with intelligent care definite results might be reported each year after the seeds were brought to the point of fruiting. I have made an effort by grafting two varieties and setting the tree away off by itself and where there is no chance for the bees to fertilize the blossoms and then saving the pits of those varieties for planting. It is my belief that we can cross breeds the same as we do with anything else and obtain good results.

The President: I do not believe that anything is ever done by chance. I thought at first Mr. Poore did, but before he got through he convinced us that he wants to go about this work scientifically to bring this about. A new fruit is not going to be chance work, but the result of wise work on his part. I think it is so with every new fruit we have. There is no chance about them, but they come in consonance with fixed laws. There is no chance about it.

Mr. Poore: The reason I made that statement is because when we ask where a fruit comes from, we are answered that it is supposed to come from this or it is supposed to come from that. What I meant by chance was that we do not know where certain fruits come from, and if we get such results what would we get if we put forth intelligent effort!

THE GRAPE.

J. O. SHARE, ALBERT LEA.

(So. Minn. Hort. Society.)

It seems that the grape has been a favored fruit in all ages of the world's history. In the Bible it is mentioned quite frequently, which indicates that the grape also in those days was cultivated to a great extent, and I imagine that some of those countries mentioned in the Bible produced a great abundance of beautiful and delicious grapes, such as we of a cold climate have no comprehension of.

The first account that we have of the grape in America probably dates back about five centuries previous to the discovery of America by Columbus, when the Northmen, a people from Norway, colonized Iceland and Greenland and made explorations in America as far south as New England. The short time they stayed in the latter country they found an abundance of delicious grapes, and they took a lot of these grapes and pressed the juice out of them and drank it and pronounced it better than any wine they ever drank. And indeed the wine that they drank, unfermented grape juice, is the best at any time; it is refreshing and healthy and will not turn one's brain upside down.

When these Northmen came back to their mother country they told of the new country they had discovered, the beautiful and delicious grapes they had found and the palatable and refreshing wine they had made; and they named the land the "Wineland." But these men, of whom Life Erickson was the leader, did not for some reason or other go back to "Wineland," and no others had the courage to undertake such a voyage in the small vessel of those days.

In America the grape is growing in the sunny South and the cold North. Here in the North we have the wild grape that is just as hardy as the oak, and will climb on top of the tallest oak, and a temperature of 100 above in summer and 40 below in winter will do it no harm. If a vine is planted to climb a tree for beautifying, plant it fifteen or twenty feet away and train on supports until it reaches the tree, then it will climb and also bear fruit plentifully. But that is not the best way to plant if fruit is the main object in planting, as that way the fruit is hard to gather, but rather plant so the vines will run along a fence, or make an arbor where one can take comfort in the heat of summer.

As a fruit the wild grape is not to be despised, as it makes one of the finest jellies, and its canned juice is appreciated for a number of culinary purposes and a healthy drink when diluted with water.

My experience with cultivated grapes is only with five Concord grape vines that I planted about eight years ago. These vines are planted near the edge of my vegetable garden, and before the ground freezes in the fall I trim off most of the new wood grown that last summer, lay the vines flat on the ground and cover them up with the loose garden soil, so they will be about four inches under ground. The whole performance is done as quickly as one can milk a gentle cow in her best flow of milk; and they have brought me more than a big pail full of grapes every summer for the last four years. The work to pick them is delightful, and to eat them more so. Grapes that one picks from the vines do not taste old and stale like some grapes bought at stores.

When ripe the Concord is good to eat out of hand, and picked before they are ripe they make fine jelly, and picked when they are full grown and commence to turn red just a little they make a lovely sauce when cooked that looks and tastes somewhat like California Green Gages. Canned Concord fruit is fine and will keep any length of time. My grapes are planted in a sunny place on high land in black, rich soil, and have had a good crop when we had a wet season, and the last summer, when we had such an unusual drought in our locality and on account of which my crop of sweetcorn was an entire failure, I got a good crop of Concord grapes. The grape vines have such spreading roots that they will reach far out for moisture. I have built a smooth four wire fence for my vines to grow on. In the early summer when they reach the fourth wire, I keep on pinching them back for a week or two, which brings the most nourishment from the roots to the fruit that is forming at that time. From then on I let the vines have their own way until I pick the grapes.

The blue jay likes to help in picking grapes. One fall I left a few bunches to eat occasionally, but before I knew it the blue jay had picked them. I caught him in the last act. But this last fall I came a trick on the blue jay. I left bunches of grapes in little paper bags, and whenever we wanted some grapes we went and picked a bag or more.

While the Concord grape has been the most common in years gone by, we have now other varieties of black and blue grapes, which are claimed to be superior to the Concord as to sweetness and earliness. And then we have choice varieties of the red and the white that are adapted to our northern climate if covered in the fall.

I want to set out some more grape vines of different varieties, red, white and blue, and raise enough for the birds, too. I think we ought to be kind to our beautiful birds.

The grape is indeed a beautiful fruit; and how it makes children "rally round" a plate of grapes red, white and blue,—and grown people, too. Have you ever noticed a few clusters of grapes added to a plate of apples? What a grand difference it makes. If an artist was to paint just one picture of fruit, I think he would prefer to paint the grape; and probably in a basket tipped over on its side; and if that picture was put in a golden frame on a fine wall, everybody who saw it would say: "O, see those beautiful grapes!"

ROOT-KILLING IN THE APPLE ORCHARD.

O. W. MOORE, SPRING VALLEY.

(S. Minn. Hort. Society.)

This is a theme upon which much has been written, many theories advanced, and still, under various conditions, we yet have root-killing with us. We all know that the cause of this injury to the trees of the fruit-grower is a climate that is not wholly adapted to his purpose. But the question before us is, how shall we proceed to assist the roots of our apple trees to withstand said climatic conditions? The practice of a portion of our nurserymen of late years, to my mind, has not been for the best interest of the fruit-grower as to hardy roots. Said nurserymen, instead of growing their own seedlings from apple seed selected from our most hardy varieties, send to Missouri or Kansas and obtain seedlings by the thousand grown in the above stated warmer climates and are surely of tender varieties adapted to said localities. And then they root-graft those seedlings roots on to Minnesota grown scions, using a short piece of root and a long scion with the hope that the short root will simply start the scion, and the latter will put forth roots, and that the grower in time will have a tree upon its own roots. Now this sounds very well in theory, but in practice as far as my experience goes the reverse is true: and that is, that the piece of root that the scion is grafted upon in most cases forms the root system of the tree. And I apprehend that it would be much better to do away entirely with all piece root-grafting for the best of reasons, that it is not nature's way of growing trees.

The most natural way that nature grows trees is from seed. It looks to me then to be a very plain and successful proposition for our nurserymen, the amateur, the experimenter and our young people, one and all, to plant apple seed. Plant Minnesota, Hibernal, Virginia, etc., all seed of our hardiest apples, each variety by itself in small plots. Transplant to the nursery row the first season, shortening the tap root slightly, thereby starting a branch root system.

Grow them thus far two years, at which time they can be grafted at the collar or above ground, as the grower may desire, to any variety of scion that we wish to put upon them. If grafted at the right distance from the ground for starting the head of the tree, the writer would prefer a scion with five or six buds that the head of the tree may be started at once. Or they may be grafted at the collar to Virginia or Hibernal for a stock, and then grafted again to any variety of scion the fruit of which we wish to grow.

Here we have, in my opinion, a root system far superior to any root-graft, and it stands in need of no hope that it will ever root from the scion. In following these methods the nurseryman will take up his seedlings in the fall the same as now and store them for winter use, the difference being that he will graft on whole roots and not piece roots, and the roots will be of established hardiness; while now it is mostly guess work in regard to the hardiness of root. It is my opinion that the time is not very far distant when piece root-grafting will be a thing of the past for our standard apple trees, but grafting or budding will be the rule on whole seedling roots.

TREE PLANTING AND FRUIT GROWING.

A. E. BENTZ, CRESCO, IA.
(So. Minn. Hort. Society.)

The questions are often asked me, do you think a farmer can raise his fruit as cheap as he could buy it, or do you not think that we have all we can do without fooling away our time with fruit, or that fruit growing in this locality is a failure?

Now as I live across the line in Iowa and seeing my name on the program for a paper, I thought I would take advantage of it and give the farmers of this locality a piece of my mind and then get back across the line again.

We know the good book says, if a man strikes you on one cheek to turn the other and let him strike that also. With me, if a man strikes me I like to strike back, and then I feel satisfied that he knows about the quality of the goods he is dealing in.

Not more than twenty or thirty years ago many of the people of northern Iowa and Minnesota thought that my chances were better for the insane asylum than for growing fruit successfully here in this locality, and they did not hesitate in telling me so. Now I don't hesitate to tell you what I think, but I don't want you to tell the farmer that I said it: that the farmer around Cresco or Spring Valley that don't raise fruit to supply his family should be sent to the pen for the offense, and he need not look for me to sign a petition

for his pardon, for it is as easy to grow fruit as it is to grow corn or potatoes.

The reason why so many fail to grow fruit successfully is because they do not take proper care of it after they plant, or else they buy their stock from parties that they never have seen before and will never see again after they get the money. How would we come out with our corn crop if we bought our seed from strangers from the east or south? What do they know about varieties that are adapted to our climate or location? Every failure that we make is a detriment to us and to the community, and every man who raises a bushel of fruit, plants and grows up a windbreak or improves his place, has benefited himself and also added to the value of his neighbor's land, and is a benefit to the country. The man who stands back and only prophesies failure stands in his own light and is a detriment to the community.

A few years ago I called on one of your Minnesota men, by the name of Michener. Many of you probably know him. He was one of the first of your locality to plant a commercial orchard. That man has done more for you Minnesota people than all of the false prophet kickers that stand back and say that fruit growing in Minnesota is a failure.

If you that were here in early days would only look back thirty years ago and even later, you would often hear the remark from the prospective settler, "I like your soil and country, but I am going where I can raise fruit." But we hear little of that talk lately.

And now a word in regard to windbreaks. This is something that every land owner should give a thought to. Most of the old groves are dying out, and by keeping up these windbreaks, which should be of evergreens, it would add much to the looks of the place and much to the comfort of man and beast, and add from one to five dollars an acre to the selling price of the farm. As a business investment, can you name anything that will pay a better dividend than intelligent tree planting.

But we must remember in all our handling of trees, digging, setting and care afterwards, it is well to bear in mind this fact, well known but often ignored, that a tree is a thing of life, that it has it's youth and old age, and that it dies; that an injury given is a shock to it's vitality, according to the severity of the injury, about the same as in animal life. So handle your trees as careful as you would your children, care for them as you do for your corn, and patronize your home nursery only. Plant liberally, and it will not be long until southern Minnesota will be the banner fruit region of the West.

THE SURROUNDINGS OF A COUNTRY HOME.

MRS. C. L. HILL.

(So. Minn. Hort. Society.)

There are a good many families who seem to act on the conviction that home ends with the door-step, and that if the house inside is well furnished and kept in order it is of little consequence as to the condition of the dooryards: whereas, the immediate surroundings of a home bear the relation to it that a frame does to a picture. No matter how beautiful and costly a picture might be, if it was set in a shabby frame its beauty would be cheapened thereby. The dooryard is the frame to the home picture.

The country home, with its generous acreage, has the advantage over the little, cramped town lot for pretty surroundings. There is space for trees, evergreens, shrubbery, flowers, vines, driveways and walks. There is the advantage, too, that but a small outlay of money is needed for such improvements. It is not money so much as inclination and labor that is needed, particularly the inclination. For where there is a will to do a thing, a way is sure to follow.

Judging from the appearance of some of the dooryards one sees in driving through the country, there seems to be a painful absence of home pride. The front yard, unworthy of the title of lawn, grows up to weeds and tall grass; no evergreens or shrubbery, and the only flowers on the place are the ones that adorn the ladies' hats. As to the back-yard, O, horrors! it is the dumping ground for all the worn-out rubbish on the place.

It is strange how any family can become accustomed to such conditions, and drift on year after year without realizing what they are losing. For certainty there is a great deal of pleasure and satisfaction to be had in pretty, well-kept yards, and, besides this, they have a moral influence on the inmates of the home. They stimulate pride in the home, and a love for the beautiful is always uplifting and refining. Children raised in homes where the parents are indifferent to the care and beautifying of the grounds around the house, lose much from their lives. The child heart delights in nature's growths and beauties. No artificial creation of beauty can give such keen delight to their little souls as to watch the development of a rosebud or snowball as it bursts from bud to flower. The child who learns to love nature through the beauties of his home, whose interest in plants, trees and flowers is awakened in the tender, loving years of young childhood, carries with him a love for these things and a tender memory of them all through life.

It is difficult to change the sentiments and ways of people who have reached middle age or crossed its threshold. Their habits of thought and action are so fixed that there is but little hope that they will view things in any light but their own. Any one who has reached that limit and remained indifferent to beautifying the external part of their homes will probably continue to do so to the end of the chapter. But if there are any young couples present who are just starting homes of their own, I would urge them to make it a part of their plan to regard the grounds around the house as much a part of the home as the parlor or kitchen. Lay them out with an eye to beauty, convenience and comfort. First of all, keep them clean and neat. Set out trees, evergreens, and just enough of the substantial varieties of flowers to be a pleasure but not a burden in their care. There are a few flowers, such as lilacs, snowballs, paeonies, roses, that are so beautiful and make such a pretty effect in the yard, and still are so hardy as to require little labor in their care.

It seems but natural for the wife to take the lead in the plans for beautifying the home; and there are few men who can not be led by their wives into feeling an interest and pride in the outward beauty of the home, and be willing to do the hard work for its attainment. And this interest is like every other good thing, it grows with encouragement and practice.

We believe there is no part of the farm where the labor and money expended brings more comfort and satisfaction than in improving and beautifying the grounds around the house.

IMPROVEMENT OF PRIVATE GROUNDS.

C. C DIKE, WHITE BEAR LAKE.

It is very hard to make an attractive place without something in or around it that is attractive, something as a central point, in itself beautiful and pleasing. In private grounds the dwelling house is naturally this central attraction. It should be a good building fully meeting the wants or requirements of the owner and should contain in its structure something characteristic of the person and suited to the location. I once asked a man if he was going to build. "Oh, yes," he said, "as soon as his architect could give him a house." What he meant was he wanted a house that filled the needs of the man and adapted to the location.

Now having secured a house suited to the location and individuality of the owner, well built and containing lines of architectural beauty, one is ready to beautify and adorn the grounds. The teeming millions of human beings have differences enough in their features to be easily recognized by their friends, and the group-

ing of eyes, nose and mouth form the principle difference of those millions of features. The arrangement of the grass plot, or lawn, the laying out of driveways and foot paths, and the grouping of trees, plants, shrubs and flowers, is what makes or spoils the beauty of public or private grounds. To have beautiful grounds no *one* thing contributes more than good thick, rich, velvety grass. This, of course, first calls for a thorough grading and smoothing up and rounding out of all the unsightly points.

In grading and laying out grounds the natural lay of the land should be studied closely, or you may very seriously injure the beauty points. In making lawns care should be given to a thorough preparation of the soil. It should be well plowed and thoroughly enriched with good stable manure, and harrowed, pulverized and rolled until a good smooth surface is secured. I believe the use of subsoil plows where the land will permit pays richly, for it is claimed this treatment forms a reservoir for the retaining of the moisture which is absolutely necessary for a good catch of grass in a dry season. A good, rich, thick, velvety surface of grass is a question of time, but I think plenty of good seed, moisture and rotten manure—in cases of necessity commercial fertilizer can be used —with frequent resowing of the thin places, will ultimately produce a rich, smooth, grassy lawn. I am inclined to think that many a fine lawn has been spoiled by too close mowing with the lawn mower, and using water sprinkled over a large surface in small quantities on a hot day. Good buildings, not costly as a necessity, but tasty and suitable, with a good, rich, smooth lawn will make a pretty place anywhere.

Driveways and paths, I think, come next. The natural lay of the grounds should be studied now and not have things too straight and stiff nor so utterly regardless of straight lines as to be constant temptation to leave the laid out paths or drives and cut across. All grounds are viewed from three points, viz.: 1st, from points without to points within; 2nd, from points within to points without; and 3d, views entirely within the grounds. Now, driveways and paths lined up with trees and shrubs may open up or create views of their own or they may completely cut off some beautiful view either outside or in, and the secret of landscaping on large or small scale is to open up the beautiful and shut out the unsightly.

Driveways and paths should be well built, smooth, slightly crowned in the center, and covered with asphalt, coal cinders, gravel or common earth. To be a thing of beauty they must be kept perfectly clean from grass or weeds. A row or a double row of

trees on each side add much to the effect. Soft maple, cottonwood, Lombardy poplar or the willow are much used. Of these I think I prefer the maple. Chas. A. Green, of Rochester, N. Y., claims the Early Richmond cherry makes the prettiest driveway and adds the advantage of giving a handsome revenue to the owner. The cherry, Morello and Ostheim, with me is a very pretty tree. In spring the blossom time is charming, in fruit time the tree is gorgeous and tempting, and from early spring to very late in fall the foliage is beyond compare, holding the rich deep green longer than any other tree I have noticed. When one wants to hide some defect in scenery the evergreen is useful and beautiful.

Shade trees, hedges and shrubbery play an important part in ornamentation, and great taste can be displayed in their arrangement.

I think one of the most common mistakes of private grounds is in the profusion and indiscriminate planting of such trees that when they attain their growth or even a small part of it they completely shade or hide the buildings and make of them a dark, gloomy and many times a very unhealthy place. I think a really beautiful home must have sunshine. If shrubs and plants are arranged in groups around the buildings and the large shade trees so planted that they cannot form a complete and continuous shade, the effect in many instances would be much improved.

One is always supposed to aim for what will bring to him the greatest amount of happiness, and if private grounds are to yield happiness they must possess some of the elements of which happiness is made. Every part of the grounds should be made to contribute to the end in view, beauty and comfort. The details of all places must be worked out by the owner. The problem is to make a beautiful place and not to see how much can be crowded in or how much can be left out, but out of each and all the parts to create a symmetrical and harmonious whole. The buildings should be in the right place to obtain the best views; the rich lawn should have groups of flowers, plants and shrubs so arranged as to make a changeable view as you move from point to point; driveways, trees, plants and shrubs so arranged as to conceal and yet reveal the architectural beauties of the buildings; flowers chosen to secure a continuous season of blossoms and harmonious shades; shrubbery so selected that if any one of them was left out it would break the chain of shade or contrast, or a feeling of the fitness of things. Let simplicity take the place of confusion, all of the beautiful be opened up and the unsightly shut out. Let all these be done, and whether the home be a cottage or a palace it will be a place of beauty and a joy forever.

Secretary's Corner.

ARE YOU SAVING APPLES to bring to the annual meeting? In the case of seedlings, if possible, bring enough to show two plates, at least eight specimens, one plate for testing at the time and one for keeping.

DELEGATE FROM IOWA —The Iowa state society is to be represented at our next annual meeting by Mr. F. E. Pease, of Des Moines, one of the Iowa nurserymen, and specially interested in growing ornamentals.

DELEGATE FROM WISCONSIN —Pres. T. E. Loope, of the Wisconsin State Horticultural Society, will represent that organization at our coming annual meeting. Mr. Loope has been for several years president of that society. His home is at Eureka, Wis., where he is engaged in the nursery business.

APPLE BLOSSOMS IN SEPT.—September 28th is a pretty late date for apple blossoms in this latitude, but the writer saw two crab trees in bloom on that day. Many strawberries have been gathered fully ripe this month in Minnesota also, until fresh strawberries for supper in September is no longer such a novelty.

PLACE OF ANNUAL MEETING.—Our society is to convene in its annual session in the same quarters occupied by us for that purpose the past two years, Plymouth Congregational Church, in Minneapolis. Suitable decorations will be arranged and springs put on all doors to insure quietness during the meetings. Are you coming?

A NEW STRAWBERRY PEST.—Prof. Washburn, entomologist at the state experiment station, has run across another insect that preys on the fruit of the strawberry, eating its seeds, and occasionally so far forgetting itself as to indulge in a little feast on the pulp. In at least one field it has been found to have done serious damage. In an early number the professor will have something to say of economic value to our readers about this creature.

TRANSPLANTING THE APPLE IN THE NORTHWEST.—By request in this number are published extracts from an article of the above title prepared for the last annual meeting of the Wisconsin Society, preceded by lists of replies to questions addressed to seventeen leading orchardists in the northwest, of which the extracts referred to are in large part a partial analysis. These lists are "meaty" and should be studied. They gave the writer many new thoughts of an interesting and practical character.

AN ENTERTAINING LECTURE.—Mr. P. V. Collins, well known to our members as publisher of the Northwestern Agriculturist, is to contribute materially to the interest of our annual gathering by giving us his popular lecture on Mexico, the outcome of a personal trip he made there not long since. It will be profusely illustrated by the stereopticon. Members of the society can secure complimentary tickets of the secretary at the meeting without charge. The date is likely to be set for Wednesday evening, Dec. 3, at our place of meeting.

of our members are acquainted with Mr. Dartt and his interesting work there.

"On Saturday, September 30th, in company with Mr. Mackintosh, I visited the Owatonna Experiment Station. I found the grounds in good condition and a large number of very interesting seedlings in fruit. Mr. Dartt has raised a large number of these from his Dartt's Hybrid, which is a seedling of the Tetofsky, and he thinks a cross between the Tetofsky and the Hyslop. I think it would have been better to have used seed from a better apple, for while many of these are of good size yet most of them lack in richness and in keeping qualities. The seedlings from his Wealthy show a much larger proportion of good apples than those from Dartt's Hybrid.

"Among the named varieties fruiting here were Gideon, Patten, Hibernal, Peter, Wealthy, Okabena, Gideon No. 6, Phoenix No. 50, Tuft's Iron Clad, Charlamof.

"Seedling F. G. is very good in fruit, and the tree is of upright growth and has light bark. Okabena No. 1 is a very heavy bearer and a good tree, but the fruit is small. Phoenix No 50 is a remarkably good tree, and the fruit is in season about the 1st of October and resembles a Duchess. I am much pleased with its appearance. Duchess seedling X. Y. Z. is very good.

"I was surprised at the great resemblance among the seedlings from Dartt's Hybrid, and as they come with very marked characteristics it would seem as though they form a seedling group.

"Apropos of a discussion among the judges at the Minnesota state fair, I found that Longfield was distinctly and very considerably russeted about the stem.

"The grounds of this experiment station are in excellent shape, and there are very many features of interest to those who are studying the development of horticulture of this section.

"Mr. Dartt says he is in his usual health and is doing more business than ever."

PALACE OF HORTICULTURE AT ST. LOUIS "WORLD'S FAIR."—The board of management have at length decided to give horticulture a separate building at the coming world's fair. Here is the description in their own words. "The Palace of Horticulture will stand directly south of the Palace of Agriculture and will be 400 by 800 feet, having an area of 320,000 square feet or seven and a half acres. One room in this building, 400 feet square will be devoted to fruits and fruit products, another room, 200 by 400, to a conservatory with floral display, and still another room, 200 by 400 feet, to the accessories of horticulture, such as implements and appliances for the cultivation and handling of fruits and flowers. The elevation of these palaces is such as to afford opportunity for terraced gardens and other beautiful landscape effects, while the outdoor exhibits of agriculture and horticulture will be very extensive and interesting both to the general visitor and the practical grower or expert. The plans for both these great palaces are now being prepared, and it is the expectation that they will far surpass in beauty and arrangement the similar palaces at any former exposition."

THE APPLE GROWERS' CONGRESS.—This national organization, of which Frederick W. Taylor. of St. Louis, is president, holds its annual sesson Nov. 18 and 19, at St. Louis, Mo. Members of this society are invited to attend and take a part in the deliberations. If any contemplate going the secretary would be glad to know of it in advance. For program, etc., address the secretary, T. C. Wilson, Hannibal, Mo.

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THE PRESIDENT'S GREETING.

(At the Annual Meeting, 1901.)

W. W. PENDERGAST, HUTCHINSON.

First I want to say a few words by way of greeting to the members of this society at this, their annual meeting. It is a great pleasure to me, and I have no doubt it is a great pleasure to every one of you to meet here year after year as you do. Otherwise you would not go to so much pains and expense and take up so much of your time in attending these sessions. It must be that there is a pleasure in it, for there is always a pleasure in being of service to some one else. If we should go back over our lives, look through the album that was clean and white at first and pick out the pages that we should like to dwell upon and look at, it would be the pages that would record the good that we had done, something that we had accomplished for those around us something that showed that we were true philanthropists in the noblest sense of the term.

From the humblest beginnings we have come to be—and I say it without any spirit of boasting, but it is perhaps because we were driven to it by the strenuousness of the situation in which we found ourselves—but at any rate we have come to be the largest society of this character in point of numbers in the whole United States; larger than a dozen others that we might select all put together; larger than half a dozen state societies as they will average through the country, and the number is still growing. Today we have something between 1,000 and 1,100 members on our list. (Applause.) This is something to be proud of. We have looked forward within the last few years to the time when we thought we might reach that point where we could use a one and three naughts to express the number on record as members of the society. We have passed that

milestone, but we are not yet satisfied, and now we are making giant strides towards the next one.

Each year we are getting new ideas from one another, and we go home and put those ideas into practice, those that seem to be of value to us. Each year adds new facts, and after thinking over and revolving them in our minds we follow out the principles on which these facts are based, and then when we have done that we have got a good pedestal to stand on. Our course is so rapid. Of all the millions of dollars spent by the state of Minnesota in the state to help along enterprises that are considered valuable, the little pittance that they give us does more good than a like sum, it seems to me, can do for any other purpose. Just see what has been done to add to the comfort, happiness and wealth of the state through the medium of this society! If some one discovers a new planet, that never will shed a new light to us in a practical way, his name is heralded from one end of the world to the other. If one originates a new apple that will be of untold benefit, as the Wealthy has been to the country and to the whole world, for it has gone across the sea, he may never get any credit while he lives, or if he does get any it will be dealt out in homeopathic doses. But that is neither here nor there, for that does not concern us. The great remuneration, the compensation that we are to receive, does not come in the way of praises from others, but it comes from the consciousness of duty well performed; and those members of this society who have been through all these years bearing the burden through the heat of the day, and without a thought of personal gain to themselves only as the whole state gains, they are the ones that have the consciousness that buoys them up and keeps their heads above the water. They are the ones that go down to the grave and may feel that posterity can rise up and call them blessed, because they have in their way been instrumental in bringing about the grandest results that have been brought to this state without any greater help from this state or from those that have been able to give than our society has had. However, it would not do any harm to give them some good words while they live, not because it will benefit them so much, but because it will show that they are appreciated, and when one appreciates the life work of another he is more likely to do something of the same kind for himself and for others, as the one he is imitating has done.

Now the society has done a great work, but can we fold our hands and lie down and rest? Can we say, "a little more sleep, a little more slumber"? No, there is a little more work yet; we must

die in the harness, and we never shall find a better place. There can be no better position in which men can meet the great adversary than doing some good in the world, or letting some sweetness and light shine in where there was so little before. There is no danger of doing too much, no danger of overproduction. Just think how the demand has increased continually throughout the country, more rapidly in proportion than the supply has increased, and the supply has increased to almost marvelous proportions; but it is like getting money, every one that has any wants a little more, and so every one that has had a taste of good things wants a little more. He knows that fruit is one of the best articles of food that he can get to keep him in a good healthy physical state, and it is not bad to take. Some refuse to take the bitter pills that the doctor deals out, but this is a better medicine that we all like.

In addition to planting trees for use in a mercantile way we should do something in the way of planting trees for ornament and beauty. Lawns and fruits and trees and flowers change the wilderness to a garden. Improve the home, improve the school house and its surroundings, improve the last home that we shall visit. Take pains with the cemetery and do not let that remain as repulsive as a great many we have seen in our younger days. I am glad to see that the people of today are paying more attention to this side of life. Let us do this, and success is assured. We have made no great flourish of drums and trumpets. We have not been like the boatman on the Mississippi river who built a boat in which he placed a twenty horse power boiler and a forty-horse power whistle, and every time he blew the whistle he blew off so much steam that he had to run into the nearest bank and tie up for two or three hours until he could get up enough steam to go on again. We have done nothing of the kind, but we have pursued the even tenor of our ways, and the work we have done must speak for us.

We have got a long, hard week's work before us, or what would be a hard week's work if there was nothing good connected with it. No matter how hard we work, if we see something from that work, every hour something gained, the work will be easy. Let us keep on. It is

> " * * idleness that always faileth,
> Idleness always despaireth, bewaileth.
> Then work, work, for the dark rust assaileth,
> Flowers droop and die in the stillness of noon."

TREE GROWING ON COTEAU FARM.

O. C. GREGG, SUPT., LYND.

Prof. S. B. Green, our horticulturist at the State Experiment Station, has under his charge at Coteau Farm a small area of ground which has been devoted to forestry. We have become much interested in tree growing as a result of this work. I am not the only person that has become so interested because of it; many people from our own county and from more remote districts have made visits to this tree plantation, and have gone away with the determination to begin to grow trees themselves about their own prairie home-

THE VALUE OF A WINDBREAK.

One of the most important things which has been accomplished is the establishing of the fact that a hedge protection which checks the sweep of winds from the south and southwest is the great requisite for the beginning of a successful tree plantation, both for shelter and ornament. The white willow has served an excellent purpose, but we have found during the past few years that the golden willow is superior to it. It is equally as rapid in growth; it is more beautiful in appearance and apparently (we speak from a short experience) it is less liable to be infested with the bark louse and the saw fly. The bark louse is the more injurious insect of the two. It is a very difficult insect to destroy. We suffer some injury from it every year. This bark louse trims up the tender and lower branches of the willow hedge. It begins its ravages during the latter part of the summer and spreads almost like a flame along the hedge, sapping every lower tender twig and small limb. They will attack another portion of the hedge the following year. The result of their work is to destroy the low waving branches, which are so pleasant to the eye and which, of course, tend to check the sweeping winds along the surface of the ground. We have tried to destroy it by using kerosene emulsion, but it proved to be too expensive both in material and in labor. At the present time we are inclined to let it work its way. The saw fly is readily destroyed by the use of Paris green and a spray pump. The saw fly is the most destructive of the two insects if left to itself. We think at the present time that two valuable shrubs will be added to the list of hedge plants, one of which is the buckthorn and the other the Russian pea tree (Caragana). So far as we know no insect pests feed upon these plants. They are hardy in the extreme and grow in very good form.

HOW TO PROTECT A GROVE FROM SNOW.

The first groves planted upon the prairies were, as a rule, badly broken down by the snow which drifted in upon them, causing the

limbs and oftimes the whole top of the tree to be broken down, and often the main trunk. Such a grove is unsightly in the extreme and cannot, of course, be a thrifty shelter belt. The most unpleasant thing which one finds when riding over the prairie region is noticing such groves that have been marred by drifts, broken down with ice storms and greatly injured by the dense grass and tall weeds which have been allowed to grow among them. The true way to prevent this trouble is to leave from one to two spaces of from one to two rods in width between the shelter belt of willow or any substitute plant and the beginning of the planting of other trees. This area need not be lost in utility because it can be seeded down, now and then top dressed with manure, and will furnish a good supply of hay each year. If there be but one such border it makes an excellent turning place for the teams while cultivating the trees. This long platted area, which should be sodded, makes what we call a snow storage. The drifts pile upon it. In case the lay of the land is such that one such area will not take all of the snow, then we should use two by placing a second hedge row between the two borders as described. With such an area so protected, mainly from the south and southwest, the west and north, there can be grown with great success those trees which have proved to be with us most hardy.

SHORT LIVED TREES.

From present experience we would recommend two varieties of trees as being most successful for southwestern Minnesota. One of them is the European birch. This tree was brought from the mountains of Europe, where it grows with thrift close upon the snow line of the mountain range. It has a grand root system: hence the tough limb—no sleet storm can break it down. It is sturdy in its appearance as well as shapely in its growth. When this tree is planted upon the rich soil of our prairies it responds wonderfully well to its better location, grows rapidly and makes one of the best trees that I know of to be planted in connection with others that we will soon mention.

The next tree in order of merit is, I think, the Russian poplar. This tree grows rapidly, is more tender in the branch than the one already mentioned, but will excel it in growth. It is far superior to the cottonwood. It also is shapely and pleasant in its appearance.

THE LONG LIVED TREES.

If one studies to be successful in the growing of forestry upon the prairies they will, I think, adopt a method that I know will succeed. Plant the short lived trees in connection with the long lived

ones, with the thought in mind that after a time the short-lived trees will be cut out, leaving the long-lived ones to hold final possession of the ground. In such a planting the trees, of course, will be planted much thicker than they are planted to eventually stand. The standard tree among the long-lived is the American white elm. It is as thrifty in its growth upon the southwestern prairies as in old England. The oak is another tree which should be planted as a permanent one. The jack oak is to be commended because it holds its leaves. The white oak and bur oak are also to be highly valued. The hackberry is, I think, superior to the ash. It is indeed quite a favorite with us.

NURSE TREES.

While we write this section in plural, I am inclined to place but one tree under this class, and that tree is the box elder. It makes the densest shade of all of the trees that we grow. It will make a forest condition more rapidly than any other tree that we know of. It is infested with what is commonly called the box elder bug. So I would not wish to grow many of them for any length of time about the house, but for a temporary nurse, where you wish to make a forest condition very rapidly, it is the tree of all trees.

THE CULTIVATION OF TREES.

I cannot spend much time giving details under this head. We will condense the matter by saying that first of all for the first few years (say from three to five) we should certainly cultivate them. We use with a great deal of satisfaction the Planet Junior horse hoe, a surface cultivator that will accomplish more work in a given time than any other tool that we know of. After that time, when the trees have made a good start, then the mulching point starts. It works well with us, indeed each year the system grows in our favor.

THE EVERGREENS.

Within the shelter of such a hedge row and again protected by these deciduous trees mentioned we can easily grow in southwestern Minnesota all of the evergreens that can be grown anywhere else in the state.

It is not necessary to grow the Scotch pine because it is hardy. The spruces do excellently well. The evergreen which ought to stand at the head of the list is the red cedar, which is a native of the river banks of the Redwood river, tributary to Minnesota.

It was supposed for a long time that the white pine could not be grown in this section, but it can, and with great success when the shelter that we have referred to has been provided.

Mr. Jewett: Do you find that the hackberry stands drouth?

Mr. Gregg: It does as far as we have tried it. That is a tree of later trial.

Mr. Terry: I have tried it thirty years, and it is just as good as ever.

Mr. Jewett: I have had the same experience. My elms have been killed, but my hackberry has stood perfectly well. They are a pleasure to look at, and they have stood the drouth better than any tree I have. I have trees eighteen inches in diameter.

Mr. Dolan: That is a fine tree, too, for a hedge.

Mr. Jewett: Yes, that is the way I use it. I think the value of that kind of a tree will be appreciated fully as much by people in towns, because they can grow it as a windbreak more quickly than the willow in some places and get the protection they need.

The President: It is not only a beautiful tree, but it is a good bee tree.

Mr. Poore: I would like to ask Mr. Gregg how he likes the soft maple?

Mr. Gregg: I do not like the soft maple at all. They are too tender. The limbs break all to pieces. I have a few, but I do not like to take them up. However, I do not like the tree.

Mr. Dolan: Does the Russian poplar sun scald?

Mr. Gregg: I have had no trouble. There might be trouble where they stand alone, but mine are growing with other varieties.

Mr. Dolan: In the town of Breckenridge they sun scald very badly.

The President: They grow a great many in that arid section in Washington, but they call it the eastern poplar there.

Mr. Gregg: We grow the mountain ash very nicely, and that, if exposed, will sun scald badly, but where we have it it does beautifully.

I want to state that I have not succeeded with the raspberry and the blackberry, and I hope before I go away I may get suggestions in regard to that matter. It is not because they cannot be grown, but simply because I don't know how. We have with the help of Prof. Green made a great success with plums. The greatest success we have had was right in a grove. Plums have been a wonderful success there. It was one of the most wonderful sights I have ever seen. The plum trees were loaded with fruit, and the sun shining down on those plums made an exceedingly beautiful sight.

Mr. Poore: Do you have them about cottonwood?

Mr. Gregg: No, sir; I hate cottonwood. It always grows native by water courses, but it also grows on high land. Its limbs will hardly stand a good wind.

Mr. C. B. Waddell: Among what kind of trees do you grow your plums?

Mr. Gregg: Almost exclusively elms. I am speaking from what experience I have had, but you cannot imagine how we appreciate those plums. It is a wonderful stimulus to have fruit to eat. Now just a word or two about some other fruit: for instance, apples. There is no difficulty at all about apple growing. I set out

trees, and then I put up a high board fence for no other purpose than to shut out those southwest winds. Prof. Green used to joke me about fencing out the wind, but I saw that in order to be successful I must shut off those winds. When Prof. Green was down there last fall he saw it was a good investment. I have a very nice orchard. Now just a word or two more before closing. I have given you the situation as it is with me. In addition to plums we should grow more apples. We should always put out apple trees, and I think we will get very good results. About the matter of currants—we grow them very nicely, then we cut out the useless canes and pack them in somewhere. The plum is becoming one of our best hedge rows. I have an old cottonwood row that I am going to cut out and put plums in its place. Just a word about beautiful trees. I did think I was going to have some fine looking trees about the place, and I heard that silver leaf maple and golden leaf cottonwood were just the thing. One has a white leaf and the other a gold colored leaf. The silver leaf maple is a miserable thing; it grows up from the root and is a wretched tree to plant, and the other is not good enough to investigate according to my notion, so I have come down to using plums for our windbreaks.

The President: I have been wonderfully interested in this talk of Mr. Gregg's.

Mr. Taylor: I would like to emphasize what he says about the golden willow. It is doing very finely in our section of country. I have had it planted eight years, and it would be fit to make firewood now.

The President: The trouble with soft maple is that it dies at the heart. It looks bright and all right, but when you come to examine it you will find it is seasoned. The wind absorbs the moisture from it in the winter time.

Too many Ben Davis.—The present indications are that too many Ben Davis are being grown for marketing at a figure to yield a profit, and the situation can hardly be expected to improve. Its success as an orchard tree has evidently stimulated its planting beyond the demand for so inferior an apple. This does not hit Minnesota very hard, as few of this variety are being grown here. There is, however, some disposition to plant it which might well be discouraged, if for no other reason on account of its failure to come up to a safe standard of hardiness.

THE BOX AS A MARKETING PACKAGE.

A DISCUSSION.

Prof. Wm. Robertson: I have heard quite a few statements about honesty in the matter of marketing, and I can remember when it used to be the custom to put the best wheat on top and put screenings in the middle of the sack, besides a number of other cases just as bad. The fact was brought to my mind when some one told how the seed houses would steal flax from the farmers. The speaker said a nice bushel box could be made sixteen inches square and eight inches deep, and it will lack 100 cubic inches of holding a bushel. (Laughter.) I believe that is one of the profitable features of marketing: make the customer believe you are giving him big measure and then building up on this basis.

Mr. Code: I have not measured just exactly the size; I figured it over hastily, but it was my impression that a box sixteen inches square and eight inches deep would hold just a bushel, but after thinking the matter over I believe I was mistaken. However, I believe in giving an honest bushel and an honest deal both in marketing garden truck and fruit.

Prof. Green: I want to say something in favor of this bushel box. I like it very well. I wrote an article in favor of such a box thirteen years ago. I came from eastern Massachusetts where everything is shipped in that bushel box sixteen inches square and eight inches deep. (Applause and laughter.) That is the only kind they use there. It is way ahead of the basket, and anybody who has never used anything but a basket can realize its convenience. You always have a square surface to pile other boxes on. Suppose you want to pack a bushel box with tomatoes. You say they ought to be the same all the way through. Apples ought to be faced, and that is all right; you ought to put your best foot forward. Now when it comes to shipping a bushel of tomatoes I want to show you how to pack them. Take a bushel box and take the bottom off so you can lay it top down on a plank, then take your tomatoes and lay them in layers, end up, and when you have your box filled up nail on the bottom and put your hand under the top and tip it right back. Then you have your bushel box right end up, and it shows off evenly and nicely. The next layer below is even, and it makes a nice seller. Your tomatoes put up in bushel boxes that way will sell for a higher price than if put up in baskets. I often wonder why the market gardener holds so long to the bushel basket. You get a load of bushel baskets into a wagon, and I tell you it is a wiggly affair. But you put on your wing boards and put on those boxes, and you can stack them up three tiers high, and they will be perfectly solid. You can build your load right up with those boxes and make a solid mass of it, which you can't do with baskets. You can go anywhere with it. A bushel basket is a regular old woman's package. It is the same way in packing apples and other fruit; if you use those bushel boxes, you can make a neat and nice looking package. Then, it is a package that cannot be broken so easily. I am very glad to hear this gentleman speak in favor of this bushel box.

Mr. Bush: We are raising a great many apples, and they can be most easily handled in those boxes. The same is also true of onions —and the best growers are largely handling them in these bushel boxes Prof. Green speaks of. The men who do not have them are obliged to sell their onions early in the season, while the men who have them can pile them up in sheds or storage places and hold them until they are wanted in the south, and they sell them for from seventy-five cents to $1.00 per bushel, while their neighbors are compelled to sell them early in the season for fifty cents a bushel. I believe our apples can go to market in these bushel boxes, and I believe they will bring more money. I believe we are waking up to the value of this kind of a package.

Mr. Carl Vollenweider: I would like to state how I ship my apples to market. I take a board a foot wide and have it planed down to three-fourths of an inch, and then saw the ends for the boxes 11 inches long. Then I get common slats, plane them and saw them 23½ inches long. That makes a box 22 inches on the inside, by 11 inches wide and a foot high, and they hold five pecks of apples, and I can take thirteen and set them into the wagon box so they will fit tight. There is no room left to shake about, and if the sideboards are wide enough I put a slat across and set another tier on top. That makes twenty-six boxes I can take to market at one time. That makes thirty-two bushels, and the apples all get to market in first-class shape. I was thinking of making inquiries here as to how fruit is shipped into this market, and I would be very much pleased to have the society establish a standard fruit package in which we could ship our fruit.

(Allowing for 2,150.40 cubic inches to the bushel—the Winchester bushel—the above dimensions figure out 1.35 bu., a little over a bushel and one-third, a generous allowance for the necessity of filling the box scantily.—Sec'y.)

Mr. M. Cutler: I would like to ask Mr. Bush what the size of the box or crate is that he mentioned?

Mr. Bush: The size is about the same as has been spoken of, so it will hold a full bushel; just so the fruit or vegetables will go in a little deeper than the top of the box to avoid bruising those that are on top.

Mr. Cutler: Are the boxes made tight?

Mr. Bush: No, they are made of lath. They cost about six or seven cents apiece.

Mr. Jno. Freeman: I just want to ask a question in line with that asked by the last speaker. I wish it might be determined what are the dimensions of the true bushel package, inside measurements?

Prof. Green: The height of the box is just a trifle over eight and one-half inches; the other dimensions are the same as have been given.

Mr. D. T. Wheaton: What is the customary way of selling fruit and vegetables, by bushel measurement or weight?

The President: When you go a little further west you will find everything sold by weight. You can hardly mention a thing that is

not sold by weight. Apples, peaches, pears, plums, everything is sold by weight excepting eggs, and I am not sure whether they are sold by weight or not. I did not have occasion to buy any.

Mr. Cutler: I think all of our boards of trade will soon establish the custom of selling all kinds of vegetables by the hundred weight. In Duluth they are now selling all kinds of vegetables by the hundred. At the Princeton fair there were a good many thousand bushels of vegetables marketed. Take onions. Fifty-two pounds to the bushel is the standard; but in Illinois and Missouri, where they ship their onions, they take fifty-six or fifty-seven pounds as the standard. Therefore, I think that within a year or two potatoes and all other vegetables will be sold by the hundred.

The President: In the west green corn and cucumbers are sold by the pound.

Mr. Wheaton: I wish to know how apples are sold in Minneapolis and generally in this state. What constitutes a bushel of apples?

The President: I think you will find they sell by the bushel as measured by the half bushel.

Mr. Gibbs: If one buys a bushel of anything he is entitled to the number of pounds in a bushel as specified by law.

Mr. C. L. Blair: I think you go to most of the states, and you will find that forty-four pounds will make a measured bushel of apples, but in our state it requires fifty pounds. I do not know whether our legislature was composed mostly of lawyers or men who did not know how many pounds constituted a bushel. I think that was the trouble with them; they understood that fifty pounds was a bushel. Down our way the merchants sell forty-four pounds for a bushel.

PERENNIAL PHLOX.

W. E. FRYER, MANTORVILLE.

The earth wears a crown of floral beauties, and among the brightest, richest and sweetest are the hardy perennials. They fill a place in our gardens and in our hearts which nothing else can supply. Like flowering shrubs, when once planted they are good for a lifetime, and we come to regard them as a part of our homes. What would induce us to part with the grand clumps of phlox, pæonies or iris that have stood along the paths in our front yards so long and greeted us year after year with such brightness and beauty? They have cheered us through many vicissitudes, they were loved by dear ones whose voices we hear no more; their blooming calls to mind pleasant associations, happy days and friendly faces that time has taken from us. Then let us enrich our little yards, our borders and walks with these flowers, which will be ever faithful friends and companions.

No one of these perennials is fairer or more useful or will give more complete satisfaction than the phlox. Those who remember the thin-petaled, white and dull-hued purple perennial phlox of old-fashioned gardens can scarcely recognize these new varieties as the same flower. From July until late in the fall they present huge pannicles of close bloom, like that of hydrangea, while the individual florets are twice the size of the old-time phlox. The colors are of the brighest, richest and clearest, consisting of all the different tints of rose, carmine, red and purple, as well as pure whites with distinct purple or crimson eyes.

They succeed in any position either as single specimens in the mixed border, or in large clumps or beds in the garden or lawn.

SEEDLING PERENNIAL PHLOX IN BLOOM

They are of the easiest culture, and the tiniest plants with ordinary care will blossom the same season they are set. They can be safely planted in September or the first of October, but I prefer to plant in the spring when the new shoots have made a growth of three or four inches. They are more easily separated then and can be divided into one or two shoots which will make fine plants for the next season's use.

About the 20th of last May we transplanted about 1,500 very small plants after they had made a growth of six to ten inches, and how well they grew and blossomed can be seen by the above cut. It was very dry at the time, yet I do not think a dozen plants died.

Mulching is necessary when they are planted in exposed positions, or when we have winters without snow. A light covering of

leaves, strawy manure, etc., is all that is required. Sometimes the buds at the crown will winter-kill. When this happens they will generally sprout up from the roots and send up dozens of small shoots. These can be left until the next season, then transplanted, and they will soon make nice plants.

I have about thirty named varieties and at least seventy-five distinct seedlings. We always transplant the seedlings when they are from two to three inches high. They never fail to blossom the same season they are transplanted but somewhat later than established varieties, and this helps to prolong the season of bloom. If the center shoot is cut soon after it blossoms side shoots will appear later and bloom as freely as the main stalk. This, also, is a good way to prolong the flowering season.

No flower on my grounds the past season caused more comment than the perennial phlox, and no one variety was so much admired as the Jas. Garland. This is pure white with large crimson eye.

If all realized how easy the culture and how gratifying the result with perennial phlox, this worthy flower would be more widely known and loved. Let me beg you to give it at least a thorough trial.

Mrs. H. K. Eves: I have heard it suggested that they die out; that the seedlings are not as strong as the parent plant.

Mr. Fryer: I am using seedlings, and they usually come back to the old variety. I have seen variations in different plants, but named varieties will be the same every year.

Mrs. Eves: I understood that the running out was usually the death of the old plant and the sprouting of the seedlings.

Mr. Wedge: I am very glad this paper was read here. Phlox is a favorite of mine, and I think it is something that needs just the attention our friend has given it. In regard to the trouble the lady speaks of, I think the facts are just these: If the plants are neglected, simply left to themselves, with perhaps fair cultivation, the seedlings are liable to be different when they take the place of the old plants. As the old plant loses vigor it should be divided, similar to the paeony and other plants of like nature. By this method of dividing the old plants and giving them a new setting and taking care they are not seedlings of the original plant, there will be no trouble about running out.

INFLUENCE OF CULTIVATION ON THE PERMANENT IMPROVEMENT OF FRUIT.

DEWAIN COOK, JEFFERS.

The public at large undoubtedly have but a faint idea of just how we came by the fine fruits of the present day, and that the fine apples of the present day are descendants of the small, sour, bitter wild crab of Europe, our Concord and Worden grapes from the wild Labrusca grape of America, the large blue plum of commerce from the small, bitter sloe of the Eastern Continent, etc., etc.

It is said that all wild fruits are easily domesticated and take on the impress of culture. It will be remembered that our garden varieties of fruits are not natural forms but are the artificial productions of our culture. These artificial productions have a tendency to improve under cultivation, but they have a still stronger tendency to return to the natural or wild state. But it is also claimed that these retrograde seedlings never quite return to their original wild state; hence, whatever improvement we may gain by cultivation will to some extent, at least, be permanent, and with the various methods of grafting, divisions, etc., I know of no reason why we can not hold permanent all improvement that we may gain through civilization.

The object and tendency of cultivation of fruits is to diminish the size of the seeds, refine the quality and increase the size of the pulp. When we take note that the aim of nature in its wild state is only to produce healthy trees and plants and perfect seed for the production of its specie, then we can understand something of what cultivation has done up to the present time for the permanent improvement of our fruits.

Some may say that the taking of fine varieties of native plums, like the De Soto, Cheney, Rollingstone, Forest Garden, Aitkin, etc., as wild fruits direct from the woods disproves this seed statement. But let it be understood that it is generally conceded by our advanced horticulturists that our native plums were once cultivated by some prehistoric race and have not yet quite returned to their original wild state.

Cultivation for the improvement of our fruits is not to be taken in the narrow sense of just stirring the soil with a hoe or a plow. One of Webster's definitions of "cultivate" reads as follows: "To improve, to meliorate, to labor to make better, to correct, to civilize." Thus, when we transplant to a better location, manure, plow, mulch, cut back and girdle for the purpose of getting extraordinarily large fruit, when we cross fertilize or plant seeds from the best specimens and from the best seedlings and select the best from these, in fact,

plant breeding as practiced by Prof. Hansen, Luther Burbanks and others, it all comes under the head of "cultivation for the permanent improvement of our fruits."

THE GARDEN OF EDEN.

ROBT. PARKHILL, CHATFIELD.
(So. Minn. Hort. Society.)

Ages ago when the world was new,
  Grandfather Adam and Grandmother Eve
  Owned all the earth, but a tree or two
Pendent with apples of rosy hue—
  If ancient tradition we may believe.

Then came a time—but the tale you know—
  Tempted, they tasted that fruit of fame,
HE held the branches down so low,
SHE gathered apples and toil and woe:
  Each shared the sentence, both to blame.

Never again might their eyes behold
  Eden, the garden so fair and grand.
Silvery lakes girt with sands of gold
Mirrored the scene in that orchard old:
  "Leave it forever," the stern command.

Roaming the woods as the years roll by,
  Earning their bread by the sweat of their brow,
Often for Eden they pine and cry,
Thorny the roses on which they lie,
  Bitter the apples they gather now.

Sunset of life brought them rest, and then
  Eden the sinless they found above,
But often to earth they returned again,
Searching if yet had been found by men
  Apples like those in the Garden of Love.

Rambling all over the torrid zone,
  (Legends assure us this tale may be true)
Grandma got weary, so Adam alone
Floated away on a trip of his own,
  Looking for Eden in regions new.

Nightly the Star of the North his guide,
  Slowly he sought for a cooler clime,
Daily he sighted the flowing tide
Of the Father of Waters, so deep and wide,
  Making a picture of beauty sublime.

Glimpses of prairie and lake and stream,
  Visions of orchard and grove and home,
Follow so quickly they almost seem
Only a fancy or waking dream:
  "Eden!" cried Adam, "no further I'll roam."

Spying some fruit on a Wealthy tree,
  Adam excitedly 'phoned to Eve,
"Here is the apple you gave to me,
Hurry now, dear, and come and see
  Eden the new, and then you'll believe."

Grandma affirmed that old Adam had found
  Eden the new and the apple of fate.
Ended their journeys the earth around:
But both are agreed that this place so renowned
  Is the home of the WEALTHY, the North Star State.

SEEDLINGS.

CLINTON L. LUCE, ALBERT LEA.

(So. Minn. Hort. Society.)

A well known essayist, lecturer and student of social conditions has declared that art is simply one's joy put in his work, and there can be no question but what that is an excellent definition of the word "art." Presuming that this is true, every man and every woman, every boy and every girl, can be an artist, and only as this joy exists is the true nobility of labor disclosed, for one who finds no joy or happiness in his work is a drudge, a slave, and is denied the wider sphere of enjoyment in which he was intended to participate according to God's great plan. Such people can be likened to "the brother to the ox," referred to by good old Edwin Markham. The sooner one realizes and thoroughly understands that life must be one of ceaseless activity and responsibility, the sooner will enjoyment go hand in hand with labor, and the world be brighter and better in consequence.

It seems to me that the horticulturist has the opportunity of getting more enjoyment out of this brief and uncertain life than those engaged in almost any other avocation, and as his joy is mingled with his work he becomes an artist—not like Raphael or Titian, who painted symphonies on canvas, but after the style of Patten and Harris and a host of others who have made themselves immortal and benefactors to their fellowmen, not only to horticulturists but to the people of the entire world. If one is to have credit if he make a blade of grass grow where none has been before, how much more credit must be accorded him who originates something that will be of untold value to the world. He not only puts joy in his work and becomes an artist, but he is a philanthropist in every sense of the word, for he has bestowed upon his fellowmen something that could not have been purchased by wealth or influence. To me

the propagation of seedling apples, or fruit of any variety, is one of the most fascinating occupations or pastimes a person can have, and there are large trees on the old homestead in another state that are monuments to the efforts of my childhood along that line; but a stranger's hand has not dealt with them as kindly as it should, and the best results have not been attained. A noted writer, in speaking of his old home that had passed to strangers said:

"Oh, ye who daily pass the sill,
Step lightly, for I love it still."

and I often think of these lines when reminded of the seedling apple trees planted by the writer when life was young and hope more buoyant than in after years.

In the vicinity of Albert Lea several good specimens of seedlings have been produced, and those who have them have accomplished much, but if every horticulturist in the state planted some apple seed each year and raised a few trees the possibilities of some one securing the prize of one thousand dollars offered by the state society would be largely increased, and many hardy varieties would be secured—and that is what is wanted the most of all by fruit-raisers of Minnesota and the northwest, where climatic influences have so much to do with the results of their labor. There are little nooks on every farm and in every nursery, or even on city or village lots, where a dozen, or even half that number of trees can be permitted to have space to grow and develop, and when they have been tested as to the quality of their fruit if found advisable they can be removed and others put in their place and the experiments continued uninterruptedly, for it is written that a "tree that beareth not good fruit shall be cut down."

In choosing seed to plant, the best fruit should be selected, as it seems to be admitted that better results can be expected in that way than in any other, since heredity is not confined to the animal world by any manner of means, and the tendency to "breed back" is so great that it must have attention from the careful experimenter. But a few years are necessary to make the test, and if the trees are given attention they will thrive in a most interesting manner. Personal attention is not all lost on vegetables and trees, as they seem to yield to the influence of care as readily as do many of the domestic and wild animals. If one plants an apple seed and leaves it to become choked in grass and weeds without any attention, he will get little joy out of it, and he will never become a great artist, for there is no excellence without great labor.

The first year after the seeds are planted the prospective tree is but a plant, but in most cases there is a vigor that promises well for the future, and the artist watches his prospect with jealous care—but he is impotent to add a leaf or increase the color in the foliage except as he complies with the laws of nature. The next year the stem becomes noticeable, and the style of tree one is to have is to some extent disclosed, and the artist permits his hopes to rise while he gives the stripling increased care. The third year the plant has become a shrub, and the woody nature is more plainly disclosed to the

anxious watcher, and all the time calculations are being made regarding the style of fruit that is to be produced. The fourth year the stem has developed into a trunk, and the inanimate being that was once a plant is now a tree and begins to be sturdy and strong. After that the seasons come and go with such rapidity that the tree is soon showing the style of fruit it is to produce, and the artist is rewarded for his labor according as the fruit is good, bad or indifferent. But if it partakes too much of the original crab apple he has other trees that will soon be ready to produce fruit, and so his interest is maintained, and he is ever in position to expect something fine and yet at almost no expense.

This brief paper has not been written with a view of instructing those who have devoted a lifetime to this work but rather with the view of opening a subject that I consider of prime importance to the northwest, not only to horticulturists but to the people in every walk in life, as fruit is one of the most valuable products of the soil, and the better the varieties produced the more the people of the world are indebted to that branch of industry. If each person in this meeting will go home and decide to each year plant a few seedlings the result of the next decade will be astonishing.

PLUMS.

JENS JENSEN, ROSE CREEK.

(So. Minn. Hort. Society.)

In raising plums the first thing necessary is to have a plum tree to grow from, and for farmers generally I see no other way than to buy them from some nursery, and the nearer home they can get them the better.

Trees propagated on wild, or native, roots are probably the best for this part of the country. In buying trees buy one, two or three years old. I would just as soon have a two-year old tree of plum or apple as any other size. They will generally commence bearing in three years from graft. Seedling plums will generally fruit in three to four years.

A good way to get plums quickly is, if you have a small tree, wild or seedling, with limbs one-half to one inch thick, graft it to any variety you wish. Take care that the scions don't grow too fast; if they do they will break off. The third summer after grafting you will have plums.

How to plant: I plant in rows twelve feet apart in the row and from sixteen to twenty feet between the rows. In planting a plum orchard of twelve trees, I would prefer to have at least six varieties. If it was to consist of twenty-four trees I would not have more than six varieties.

What to plant: I may not agree with some of the old horticulturists, but my list will consist of such varieties as have done well for me.

(Early) Cheney, Gaylord; (late) De Soto, Rollingstone, Ocheeda, Miner.

I omitted the Aitkin. It has not fruited for me, so I do not know much about the tree or its fruit.

The first two or three years plant potatoes between the rows, and when you cultivate your potatoes you will not forget your plum trees. Weeds and grass must be kept away from them. Mulch in the winter, and when a tree commences to bear fruit keep it mulched in the summer too.

If you have no other way of getting a plum orchard buy some plums and plant the pits, De Soto or Miner, if they can be had. In a few years you will have plums and some pretty good ones too, although many of them may not be large enough for market.

My Plum Orchard: In 1894 I bought four quarts of De Soto plums and planted the pits. I got nearly a hundred trees. Many of them I have grafted to named varieties. I have now thirty of the seedlings bearing fruit, some of the fruit being excellent:—(1) especially a yellow plum of good size and very early, and I think might be worthy a name; (2) also a yellow plum of good quality but smaller and later; (3) and a large red plum, but not so good, to my taste at least. In 1895 I bought from Harris the La Crescent, Cheney, Rollingstone and De Soto. I have since acquired by purchase and by gifts of scions from Hawkins and Kimball twenty-eight named varieties, among them three European varieties. One of the European may be of some value here.

In 1898 my orchard commenced bearing, but the fruit turned black. In 1899 it was the same. I did not get a peck of plums that were fit to eat. In 1900 I bought a "sprayer" and sprayed with Bordeaux mixture and got a good crop. In 1901 I sprayed again with the same, and if it had not been so dry I would have had twenty bushels of plums. I had about fifty trees bearing this year and shall probably have about sixty or more next year.

I have two trees I dug up along Rose Creek. One bears a yellow and the other a light red plum; both very early, good size and very good.

The trees best standing the drought this year (1901) were the, Gaylord, Cheney, Rollingstone, Miner, Davis, Damson and trees of my De Soto seedling, also the two trees I dug up along the creek.

THE FARM MOTHER AND HER FLOWERS.

MRS. MINNIE A. CUMMINGS, EDEN PRAIRIE.

The farm mother, generally speaking, is a very busy mother, and especially so in the summer time, the time of flowers.

In the spring, when the fields are planted, every acre is planned for, and the time seems too short to accomplish what is desired, and the flower garden is generally pushed one side. But if the mother loves flowers—and most mothers do—she can by the help of the children find the time to start a flower garden.

The time is coming when the farm mother is to be also the educated mother, for the farmer is not always, as many suppose, the man that has chosen his work because he was fitted for nothing else.

I was visiting in a fashionable home in this city, a few years ago, when the young lady daughter of the family came into the room and said, "Mamma, the milkman is in the kitchen and wishes to see you;" then added, "I declare, mamma, the man is quite decent looking." The farmer of today fits himself by education especially for his business, and if he is sensible he chooses an educated helpmeet for the mother of his children. This mother has many advantages on the farm to help her in the training of her children that are denied the mother that trains her children in the city home. Think of bringing up the children in a flat compared to the opportunities on the farm. There is toil, self-sacrifice and self-discipline, but there are also beauties of nature that teach as valuable lessons.

Educators tell us that flowers are the natural playfellows of the children. Who has not seen with what delight the little child finds the first spring flowers? How lovingly the little furry, fuzzy pasque flower is brought to mother! No wonder the children call them goslings, for they seem to be covered with down, and the instinct is to smooth and fondle them.

How fittingly the mother can use this blossom to unfold truths, deep and beautiful, that shall impress their mark on the child's character! One mother I knew was so charmed with the fields all purple with the wind flower that she taught her little child these verses while she was busy with her mending.

THE PASQUE FLOWER.

Little furry pasque flower, wrapped up from the cold,
First little flower to peep—so brave and so bold.
How did you dare to come, 'mid snow and sleet,
Out of your earthy bed the cold wind to meet?

God made us His messengers, these words to tell:
After night the morning comes—His ways are well.
So in great faith we grow, doing just one part,
Feeling sure God knows the time to tell us when to start.

In spring nature is very bountiful in her supply to the farm child. He finds the delicate anemones, the pure white blood-roots, waxy trilliums and velvety violets hidden in a fairy land of feathery ferns and early spring foliage. But each flower has its season and too quickly fades and is lost in the fast growing plants of the woodland. Now is the time for the cultivated garden to give a summer time of flowers that may be to the child a part of his own effort, a part of his own possession. "It is mine," gives the same satisfaction to the child as to us of older growth.

The mother can co-operate with the child and give him valuable training through a simple flower garden, as in a systematic arrangement of the flower beds, the careful preparation of the soil, watching for the seed leaves and keeping the bed free from weeds.

He can learn the different ways plants grow and can discover new things at almost every advance of growth. He finds the sweet pea has a woody, angular stem; that the nasturtium has a round, smooth and climbing stem; that the leaves of the geranium grow alternate and have a wavy margin; that other plants have opposite sessile leaves, as the gillyflower; that some flowers grow singly from the axil of the leaf, as the chrisanthemum, while others are terminal and grow in a raceme, as the heliotrope and forget-me-not. The mother can so direct the child's observations that he will be delighted to find the number and colors of the petals, the yellow pollen on the stamens and that the pistil contains the seed. He is charmed to find that there are family relations among the flowers, that the apple blossom, the rose, the geum and spirea all belong to the rose family. He notices that the morning glories open when he rises, and that they fold or shut up by noon; that the four o'clock does not open until four o'clock in the afternoon, and that the tulip does not open its cup if it is likely to rain.

Direct the child's attention to the fact that some flowers shut up at night as if in sleep; one kind of oxalis, with very small compound leaves, lifts its leaf up all in a bunch to go to sleep; the marigold and dandelion curl up into a ball. These tricks of the plants stir up an interest in the child that leads him to observe and investigate, not only along the paths of botany, but in other walks of life. The mother must be the guide in giving this flower interest.

Some children botanical names would scare worse than a ghost story, but most children would gain a lesson in profit and loss by

observing the difference between a well-kept garden and a neglected one.

Lessons in neatness, accuracy and nicety of workmanship can be encouraged by pressing, drawing and, still further, painting the flower he is familiar with.

A poem on the flower from the pen of some gifted poet gives him a glance into good literature that teaches him the thoughts of cultured minds on things that have become familiar to him and, on account of their correlation with his own handiwork, are personally enjoyed.

Flowers teach a lesson of *unselfishness,* for they do not bloom for one alone; all lovers of flowers know the desire to send or give their bright, fragrant blossoms to some friend. The other day my neighbor sent her little girl with a box that contained a beautiful blossom of a Japanese lily. She wrote in a note that she had enjoyed it for a day, and she must send it to me for, as she expressed it, she wanted me to have joy in its beauty, too.

The influence of the flowers is felt by the whole family. What real boy with his rough and tumble antics is not toned down and ready to have his face washed and hair combed if he may carry to his teacher a handful of fragrant blush roses?

Is it not worth while to direct the daughter in arranging a centerpiece for the table that she may know harmony of color and dainty selection? Is not a few minutes out in the early morning among your flowers a good starter for a busy day?

The farm mother needs flowers. Her life is often lonely—they become her friends; she is often discouraged—they teach her hope and faith, they give an inspiration. I had a long bed of zinnias last summer, and had to pass them every time I went to the well. It was an oft repeated pleasure to see the mass of many colored blossoms. They seemed to say, "It is fine to be here," and I simply couldn't scold when they looked so cheery. It happened that we had a big family that summer, and I had to go to the well many times; so the zinnia bed paid.

The chrysanthemums started in my summer garden are now brightening our rooms with their many blossoms. As one comes into the room the exclamation is, "Oh, how lovely!" Quite a few Thanksgiving dinner tables had a bowl from these fringy chrysanthemums to add pleasure to the occasion, and it was in the farm home, where flowers were hard to get.

If you will, busy farm mother, try one summer with a flower garden, I think you will learn the delight that is pictured in one of Longfellow's poems when he says:

"Then Nature, the old nurse, took
The child upon her knee,
Saying, 'Here is a story book
Thy Father hath written for thee.'
So he wandered away and away
With Nature, that dear old nurse,
Who sang to him night and day
The songs of the universe.
If ever the way grew long
And his strength began to fail,
She sang a more beautiful song
And she told a more wonderful tale."

Mr. Oliver Gibbs: The members of the lower house of this joint session have been keeping silent for fear of getting in the way of the ladies who might wish to discuss these papers. I would like to offer one or two suggestions on the subject of growing flowers on the farm. Whatever may be said of the farmer who neglects to have an orchard, whether he cares much about it or whether he does not, it cannot be said of the farm mothers that they do without flowers because they do not love them. You will hardly ever find a farm mother but what is a lover of flowers and would be glad to have those flowers growing at her home. We should look at this question from their standpoint, and it is a question we want to help to solve with the women of the farm, overburdened as they are with the labors of the household and the farm. It is a very difficult matter for them to get their husbands or their children or their hired men to take hold and help them about the matter, because they are also hard pushed for time. I have seen even some women who were not altogether amiable in their manner who were lovers of flowers, and I know of only one instance in my experience of a lady who I thought did not appreciate flowers very well. Now a word about this matter of time. Here is a way in which the farm mother can manage to have some flowers, although it is not the ideal way. She can certainly get her husband, when he lays out the farm garden, to leave a little spot where flower seeds can be planted the same as he plants his corn and potatoes in his garden, and when he goes out to cultivate he can give the rows a flirt one way, and when he comes in to dinner he can give the row a flirt the other way—and I want to say that the flowers raised in our garden have been treated in that way. Of course there is a little attention the mother must give to the germination of those seeds, and certainly she can get the husband and children to give a few minutes' time each day, just going and coming to and from the house, to give them horse cultivation.

Mr. A. K. Bush: I can suggest another way by which it may be made possible for the busy farm wives to have flowers, and

that is for the husband to furnish them with some of the modern household conveniences. Some of the best houses of the country today, as I said this morning, we find elegant buildings, and there are carriages and horses, and all the modern conveniences for carrying on the farm work, but we go into the kitchen and we find no conveniences; the farmers' wives use the same things they used twenty to thirty years ago. Where is the farmer who would use the antiquated implements that were used twenty or thirty years ago in the conduct of his farm labors? If the women had labor-saving conveniences in the house, and had the kitchen arranged so they would have many steps saved each day, they would have a great deal more time for other things, and I am sure if they had the time they would have the flowers and other beautiful things about the home.

Mr. O. C. Gregg: I want to shout an old-fashioned Methodist "amen" to that, and I just want to say a word along that same line. I want to give you a statement of my exeprience. I hunted a long time to find a lady who could give me a detailed statement as to how a kitchen should be arranged so as to save steps. When I was at Buffalo this summer attending a meeting of institute workers they said I had asked a question that could not be answered; it was one of those questions for which it was very difficult to find a perfect answer. My friend Bush referred to dish washers. A factory in New York failed because they could not sell their goods. They could not find enough women to use them so it would pay them to keep up the manufacture, although the dish washer was a splendid thing. Just think of it. Study and formulate a system of housekeeping by which the present labor and drudgery of the farm home will be lightened—and I hope the next generation will show the farm women how this can be accomplished before they are forty years of age. You are planning and aiming this afternoon to help this thing along. It is an important thing, and I tell you it makes me feel sad when I find that fathers and mothers are actually on all sides moving from their farm homes into the towns in order to abandon the drudgery of farm labor at home. I believe that the best place we have in America to raise good men and women is the farm home rather than the city. (Applause.)

Mr. A. J. Philips (Wis.): I desire to say just a word. I never realized the amount of work that the ladies could do when they set themselves to doing it until I had several times visited Mt Vernon, the burial place of Geo. Washington. Of course they talked some time about it, and some wanted to remove his remains to Washington. The western people thought it was a great expenditure of money. But the ladies went to work and raised money, and they bought the whole outfit for $200,000. They went to work and rebuilt the buildings, and now everything is in a good state of preservation there. I endorse all that has been said here, but there are two sides to all these questions. I take as much pains to please the women as any man living, but I have heard a few things while I have been at this meeting. I take it there are no farmers present.

I had to get up yesterday and defend the farmers when they said that nine-tenths of the trouble about the farmers not getting any fruit was due to the fact that they did not know how to take care of their trees. Now brother Bush gets up (I don't know where he has been) and says because a farmer does not have labor saving machines in the kitchen it makes work so hard for the ladies. I believe we live in a pretty good country where we treat our women as well as they do anywhere on the face of the earth. I believe the farmers' wives have more privileges, in the country where I live at any rate; they have more time to attend to their gardens and flowers than the working people have in the villages. By reason of the farmer having so many labor-saving machines and devices, it really saves the ladies a great amount of work. On a certain farm I pass every day it used to take fifteen men to do the harvesting, and now there are only two men to do that same work. It takes only half the men to do the threshing, and it is done in half the time they used to do it. It does not take a lot of men a month to cut and husk the corn; it is all done in a few days. They have money enough so they can afford to keep a hired girl, and she does the cooking, and this is the condition you find in thousands of farm homes. If you are looking for trouble you can find it everywhere. The farmer's wife has no more trouble than the rest of them. You people always talk about how selfish the men are in getting everything that will lighten their own labor, but the poor women still have to go through the same drudgery; but I tell you just as the farmer lightens his labor his wife's burden is lifted accordingly. See what a drudgery it used to be for the women of the farm to take care of the milk and make the butter. How many women on a well regulated farm do you find that have anything more to do with making the butter? Does not that take off a big burden? There is hardly a farm where I live where are more than two men constantly on the farm.

The women are not always in favor of saving work themselves. The first oil stove I ever saw in my life I saw at Mankato. A man was looking at the stove, and the agent was explaining to him its advantages. I guess he was a lazy fellow because there was no wood to cut, and he thought it was a fine thing; and he said he guessed he would buy one, but he first wanted his wife to see it. He found his wife and showed it to her, explained how nice a thing it was, how it saved cutting wood and that it was not expensive, and when he got through she asked, "But where do you build the fire?" He told her she didn't have to build a fire. "Well," she said, "I would not have a thing in my house I could bake a batch of biscuit with unless I could punch up the fire." (Laughter.)

Talking about starting flowers, you start some once, and you will have them forever. I never went to but one place in my life where I was asked to speak and hardly knew what to say. I had a neighbor, a Norwegian, who died, and the funeral was set for a certain day. I said to my wife that I was going to that funeral, and she said I had better stay at home because I could not understand what was said, and it would do me no good to go. I told her I knew that, but I liked the old man, and I was going out of respect. At that funeral they did not do as Mrs. Underwood said they did at

the woman's club. There was no room for the old man in the house, so they carried him to the granary. There was a great lot of eating and drinking; they set the table seven times, and about the time they were through and the procession was ready to start they made the discovery that there was no preacher present. I was the only American there, and they did not know what to do. The father said before he died that they should get a preacher, but if it cost anything they should not get him. The son had gone to see a preacher, but he had come home without engaging one. A man came to me and said they were in a whole lot of trouble, they were ready to bury this man, but they had no preacher to conduct the services and asked me to say something. Well, I told him I had talked at farmers' institutes, I had sold goods at auction and had talked at horticultural and agricultural meetings, but this was a new kind of a deal for me; I had never preached a funeral sermon. I asked them to sing three or four verses while I thought of something to say, and they sung those verses pretty quick for me. They had covered that casket all over with wild flowers, and after noting this, I told them how the children would go out into the woods in the spring, how they would remember the father when they saw the wild flowers growing, and then I spoke about the cultivated flowers making the home beautiful and being such a grateful offering. Those children came and shook hands with me and thanked me for what I had said—I suppose one reason was because it did not cost them anything. The next spring they planted flowers, and it is a fact that on that place they have had a nice flower garden every year since. So I think I have done a little good in the world educating farmers. (Applause.)

THE SCIENCE AND PRACTICE OF CROSS POLLINATION.

PROF. N. E. HANSEN, SOUTH DAKOTA AGRICULTURAL COLLEGE, BROOKINGS, SOUTH DAKOTA.

The topic assigned to me may properly be divided into two parts, as indicated by the title.

The wonderful results obtained by the florists in improving ornamental plants gathered together from the ends of the earth have made gardens and greenhouses a realm of beauty. I need not stop here to tell all the work done in crossing fruits. In the limited time available it will be best to speak of crossing from the standpoint of the amateur who wishes to do his part in improving the fruits of the northwest. By crossing is meant the union of different varieties of the same species, such as the Wealthy apple with the Hibernal, or the Duchess with the Ben Davis. By hybridization is meant the union of two different species, such as the Siberian crab with the Duchess apple; the sand cherry with the Miner plum, as exemplified in the Compass; or the Chinese pear with the pear from western Europe, as exemplified in the Kieffer. In other words, a hybrid indi-

vidual in the vegetable kingdom corresponds to the mule in the animal kingdom. The word "crossing," however, is often used as a convenient term, meaning both crossing and hybridizing. Over fifty years ago Lindly said: "Hybridization is a game of chance played between men and plants." In other words, there is no means of foretelling what the result will be when plants are crossed. Especially is this true with our cultivated fruits, as all are more or less of mongrel ancestry.

The main benefit in hybridizing plants is to break up the fixity of type. Then when this is done the seeds of these hybrids should be planted largely to give an opportunity for the forces of heredity to assist themselves. Burbank, of California, and Theodore Williams, of Nebraska, find, in improving plums, that hand crossing is of use mainly at first to break up the fixity of type. After the hybrid plum trees are obtained they are grown intermingled close together in nursery rows, and other sorts are top-grafted in the limbs. The pits grown are then planted and nature has been given a chance. The result will be: First—If the flower is self-fertilizing the seedlings may nearly or quite revert to one or the other of the parents or to some ancestor further back. Second—If bees or the wind have carried foreign pollen, still greater tendency to variation has been introduced.

Crossing and hybridizing I regard as short cuts in the work of improving fruits. It is a means of hastening the process of evolution by introducing new elements of variation.

In 1901 the writer grew at Brookings 499 seedlings of the Compass, the well known hybrid sand cherry originated by H. Knudson, of Springfield, Minnesota. The Compass, by the way, is very fruitful and hardy at Brookings and proves worthy of a place in the home garden, furnishing an abundance of fruit just ahead of our earliest plums. These seedlings show remarkable variation, some ruuning back to the sand cherry and others approaching closely the plum in foliage. Some seedlings were selected with root intermediate between the red of the sand cherry and the brown yellow of the plum and planted this spring as one year seedlings. Many of them flowered but did not fruit, as they were transplanted. C. G. Patten, of Charles City, Iowa, has obtained very interesting results from seedlings of the Brier Sweet crab, a hybrid of the Siberian crab with the Bailey Sweet. The experiments of Peter M. Gideon indicate, however, that long keeping capacity cannot be expected from any of the Siberian crab hybrids. The amateur and the busy nurseryman can perhaps do the best work in crossing fruits by top-grafting largely, as done by Burbank and Williams, and sowing the resultant seeds.

Working with blossoms of the orchard fruits in the spring in Minnesota, and the northwest generally, is not the most pleasant work in the cold, windy weather often prevalent at this time of the year. Operating on the essential organs of a flower is a little like taking a watch to pieces out of doors. Still a few pleasant days may intervene at the right time which will permit of some work being done. Any elementary book on botany will give drawings and descriptions of the essential organs of the flower. In case of the plum, there is one single pistil in the center of the flower, shaped something like an Indian club. It forms the fruit when properly fertilized. Surrounding the cup containing the pistil is a circle of slender stalks with yellowish heads, or anthers, containing the pollen, the male fertilizing element, corresponding to the pollen in the tassels of corn. In the apple the case is somewhat similar except that there are five pistils instead of only one. Both in the apple and the plum stamens are variable in number, something like twenty, more or less. The standard method of doing the work is to take the flower a day or two before it would naturally it open, remove the petals (the showy part of the flower) and all the stamens. This can be done with a pair of fine pincers or a small pair of sharp pointed scissors. The flower is then covered with a paper sack to prevent the access of insects. Only two or three flowers should be open in one place or in one cluster, and the other flowers should be removed. If the weather remains warm the work can be completed the next day, or if cold two or three days after.

The pollen is gathered from fully open blossoms before the anthers open and allow the pollen to escape. Then the anthers must be spread out on a sheet of white writing paper and permitted to dry in a warm room with no drafts, as the pollen, a yellow dust, is very light, and the slightest breath of air is enough to scatter it. It will not do to put the anthers into a closed vial at once, because there is enough moisture in them to cause mould in a few hours. When perfectly dry the pollen will adhere like flour (it resembles flour in every respect but color) to the finger tips or to a camel's hair brush. The sack may now be removed and the pollen applied with a camel's hair brush, pencil or the tip of the finger, and the sack replaced. After two or three days, or as soon as the flower is fertilized, tear open the sack and tie it below, to indicate parentage, and permit it to remain until the fruit begins to color. The fruit should now be protected by mosquito bar, so that in case of a wind storm it will not all be lost.

There is considerable objection to the use of paper sacks, but in out-door work something seems essential to keep away the bees.

However, Luther Burbank removes all but one-tenth of the blossoms on each tree and removes the stamens by the aid of a sharp knife only. The petals also being removed by this operation, bees are not apt to visit the flowers. He runs the risk of the flowers being fertilized by pollen carried by the wind. He discards camel's hair brushes also and applies pollen with the tip of the finger. I have found it best to use this method of applying pollen where the quantity is small. Sometimes the pistils can be dipped directly into the pollen. Mr. Burbank, I understand, prefers to run the risk of fixing the pedigree rather than lose the whole flower by the use of the paper sack.

In closing, it should be stated that pollination means the act of applying pollen to the stigmatic surface of the pistil. If the pollen "takes," the flower is fertilized and sets seed.

Mr. Lord: I heard Mr. Patten say he had experimented a good deal in that direction, and that the removing of the petals was not advisable; that most of the pollen was not potent on its own pistils; that almost invariably foreign pollen was more potent than its own pollen; that emasculation had the tendency to disturb the setting, and that the best way was to apply the pollen without emasculating the flower.

Prof. Hansen: In order to obtain exact scientific results the only way is to emasculate the flower. You get surer results. The only way is to take out the stamens, as I have stated. We simply pull off enough of the petals, so they will not be in the way of the work.

Mr. C. H. True: Do you take the sack off again?

Prof. Hansen: As soon as a flower is fertilized. If you want to experiment with that you can put a paper sack over a flower just as it comes out, and the flower withers in a short time after the sack is taken off. The florists apply that principle, taking the yellow heads of anthers out of the lily because they stay fresher—waiting for the pollen which never comes.

Mr. Wedge: Do you consider it proven that the apple blossom is self-sterile?

Prof. Hansen: Some varieties are self-sterile, others self-fertile.

The President: Does it make any difference whether the pollen comes from every flower or from any flower from any part of the tree?

Prof. Hansen: It is found that some are self-fertile and some are not, but the tendency of all of them is that the further apart they are, the better. Thus, it is better for one variety to be fertilized by some other variety than by other trees of the same variety.

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New Jersey Agri. Exp. Sta., Annual Rep., 1901.
Peaches and Oranges, U. S. Dept. Agri., 1889-95.
Sorghum, U. S. Dept. Agri., 1890-3.
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Pan-American Exposition, Rep. of Minnesota Commission, 1901.

A NEW STRAWBERRY PEST.

Harpalus pennsylvanicus.

PROF. F. L. WASHBURN, STATE ENTOMOLOGIST, ST. ANTHONY PARK

This beetle, hitherto so useful in eating noxious larvae that we have unhesitatingly accepted him as our friend and classed him for years under the head of beneficial insects, has this year, for the first time apparently in Minnesota, developed a most reprehensible habit, which bids fair to put him under the ban. It seems that though preeminently carnivorous in taste it is enough of a vegetarian to eat the seeds of the rag weed (*Ambrosia*). From the seeds of this humble plant it was but a step to eat the seeds of

Harpalus Pennsylvanicus, a New Strawberry Pest.

the strawberry, a patch of which plants may have been near at hand. After tasting the pulp of the strawberry in eating the seed we can hardly blame him for acquiring a fondness for this luscious fruit. He is somewhat fastidious in his treatment of the seed, eating only the interior and discarding the hull.

On July 10th I received the following letter from Mr. Henry Grinder, of Hinckley. "Dear Sir: Can you tell me any way to get rid of the black beetle which is eating my strawberries? He works at night. The seed of the berry is all he seems to care for; he cracks that and eats the kernel of it. They hide in the mulching between the rows in the day. They are very plentiful this year. Is there anything I can put on the plants that will drive them away and not injure the berry? They have destroyed over two-thirds of the berries. Please let me know if there is anything I can do to stop them." Later, under date of July 13, he again writes as follows: "I have grown berries here for four years, and this is the first year they have troubled the strawberries."

In response to my request for specimens of the insects doing the injury, he sent me some specimens of this beetle. It was hard to believe that this well known friend had developed such a trick, but investigation of the literature on *Harpalus,* revealed the fact that he had shown this bad trait elsewhere. In Ohio in 1900 members of this genus (*H. caliginosus*) were reported as injuring strawberries, and had probably attacked strawberries before that date. In 1892, *Harpalus ruficornis* caused trouble in the same way in Holland, and Miss Ormerod mentions the same injury in England in her Reports for 1894, '95 and '97-'99.

Remedies.

There are various ways of combatting this pest in the strawberry patch. They work entirely at night, and during the season of their abundance it is barely possible that the lantern trap may be effective, though I have not had any experience with the same. It is worth trying. The lantern trap consists of a pan two-thirds full of water upon which a generous layer of kerosene has been poured. This pan is put upon a post in the strawberry patch about two feet above the ground, say, and above the pan is suspended a lantern; or the lantern rests upon a brick placed in the pan. The beetles, attracted by the light, fall into the kerosene and are killed. Several such traps might materially reduce the number of beetles. Bran mixed with water, sweetened with molasses and poisoned with paris green, if distributed under boards and in other protected situations in the strawberry patch, is also said to be fairly effective. It would, of course, be fatal to any fowl which had found its way into the patch. Some berry raisers have put cheap meat, such as lights from sheep or calves, in basins, the basins being sunk in the ground up to their top. They are examined every morning and the beetles which fall into the pans collected and killed. This insect became at one time such a serious pest in Pennsylvania that children were employed to go through the strawberry patches and pick the beetles from under the mulching and elsewhere. Fifteen or twenty dollars or even three times those sums spent in this way, if it will save two or three or four hundred dollars on the strawberry crop, is money well expended. Another suggestion is to place boards throughout the strawberry field and look under them every morning, catching and killing the beetles found there. If there is anything like ragweed growing about the strawberry patch it should be destroyed.

The illustration accompanying this article represents two pinned specimens of this ground beetle, somewhat enlarged, the hair line indicating the real size.

PROGRAM ANNUAL MEETING, Minneapolis, Dec. 2-5, 1902.

ANNOUNCEMENT.

The annual meeting is to be held in the lecture rooms of Plymouth Congregational Church, located on the corner of Nicollet avenue and Eighth street. These rooms were found last year especially well adapted to our purpose, the main room being sufficiently large for all the sessions and the evening lectures, with adjoining rooms for the fruit display which are both commodious and well lighted. There are also other rooms well adapted to the meetings of the societies that affiliate with us and which meet at the same time and place. These rooms are all on the ground floor, and are reached from the street on either side of the building.

A check room is provided where coats, etc., will be cared for.

A special effort is being made to get out at this meeting a full exhibit of all the long keeping seedling apples of merit originating in this state, and to this end premiums amounting to $75. 0 have been offered (see last page of this program). Aside from this the usual large display of fruits will be made. Let each one bring what he can, and be sure to get out all the good seedlings in his neighborhood.

A large meeting is assured. Delegates from all the horticultural societies near us will be there and a good sprinkling of visitors to add to the interest.

Don't forget the annual banquet, which will be the most enjoyable single feature of the meeting. (See page 10 of the program.)

Will you be there? Reduced railway fares and low hotel rates make this an economical time for you to visit Minneapolis and attend the largest meeting this society has ever held. At least it should be such, as our membership was never so large, exceeding now the coveted 1,000 by over 240.

And don't fail to bring the wife along. She should be a member of the Woman's Auxiliary and lend a hand at the gathering.

Hotel Vendome, 21 South Fourth Street (between Nicollet and Hennepin aves.) has, for the sixth time, been selected as headquarters for visiting members and friends, and rates secured of 75 cents per day of one in a room; two in a room $1.25 to $1.50 per day. Since the fire of last winter this hotel has been entirely remodeled and equipped with latest devices for the convenience, comfort and safety of its guests. One of the best popular-price restaurants in the city is located on the ground floor of this building. Register as "horticulturists," and you will be well treated. Only one-half block from our secretary's office and library, in the Kasota Block, and four blocks from the place of meeting.

The Minnesota State Forestry Association.

This association will hold a joint session with the Horticultural Society on Thursday afternoon. (See program, on page 10).

A business session is also announced to be held immediately following the "joint session" noted above. All members are urged to be present. For reduced railroad rates, see paragraph below.

Minnesota Bee-Keepers' Association.

The officers of the Minnesota Bee-Keepers' Association announce that the annual meeting of that society will convene Wednesday and Thursday, December 3 and 4, in the same building as the Horticultural Society. See program within.

For reduced railroad rate see paragraph below.

The Woman's Auxiliary.

This society will hold a joint session with the Horticultural Society on Wednesday at 3:00 o'clock p. m. and its annual business session on Thursday at 10:00 a. m., in some room in the building to be announced. All ladies interested in horticulture are earnestly invited to be present and connect themselves with this association.

REDUCED RAILROAD RATES.

VERY IMPORTANT.

Those attending either the Minnesota Bee-Keepers' Association, the Minnesota State Forestry Association, the Womans' Auxiliary or the Minnesota State Horticultural Society should *all secure certificates* from the railroad agent where the ticket is purchased, stating that fare has been paid from that point to Minneapolis. Do not fail, also, to get a similar certificate at each railroad transfer point where you may have to purchase a ticket en route.

These certificates should all be handed to Secretary A. W. Latham, of the Horticultural Society, at the earliest opportunity after reaching Minneapolis. They will be signed good to return for one-third fare Dec. 5th and for three days thereafter. A fee of 25 cents will be collected by the railroad agent at the meeting from each holder of a certificate which he signs.

DON'T FAIL TO GET A CERTIFICATE, as there must be 100 to secure the reduced rate.

Come, *everybody* interested in any branch of horticulture! It is *your* loss if you stay away.

W. W. PENDERGAST, President,
Hutchinson.

A. W. LATHAM, Secretary,
207 Kasota Blk., Minneapolis.

A TEN MINUTE LIMIT.

On account of the fullness of the program and to allow plenty of time for discussion, those presenting topics are requested to limit themselves to **ten minutes** in their reading, or **1,000 words.**

PROGRAM.

TUESDAY MORNING SESSION.
9:30 o'clock.

Invocation.

Greeting by President W. W. Pendergast.

Appointment of committee on credentials.

General Subject—Small Fruits.

1. Fruits for the Farmer's Garden.
   F. J. Cowles, West Concord.
2. Growing and Marketing Raspberries,
   B. A. Seelye, Preston.
3. Planting and Care of the Raspberry Field the First Season,
   R. A. Wright, Eureka.
4. Covering Bush Fruits,
   D. V. Plants, Long Lake.
5. Practical Advertising for the Fruit Grower,
   Frank B. White, Monon Bldg., Chicago.
6. Strawberry Growing,
   C. A. Sargent, Red Wing.
7. Strawberries for the Farmer,
   Prof. Wm. Robertson, St. Anthony Park.

Renew your membership or become a member by paying the Secretary $1.00.

You can become a life member by payment of $10.00, in two **annual payments of $5.00** each if you prefer. This will entitle **you to a file of our** bound reports, a library in itself.

TUESDAY AFTERNOON SESSION.

1:45 o'clock.

1. Encouraging Words from Manitoba, Thos. Frankland, Stonewall, Man.
2. Horticulture—Its Place on the Farm, Geo. W. Strand, Taylors Falls.
3. My Seedling Orchard, T. E. Perkins, Red Wing.
4. Nature's Aid in Producing Apples Adapted to the Climate, Frank Yahnke, Winona.
5. Can We Raise the Winter Apple and How? F. W. Kimball, Austin.
6. The Propagation of the Apple Tree in Minnesota Should Be Encouraged, A. H. Reed, Glencoe.

3:15 O'CLOCK. TEN MINUTES INTERMISSION.

7. The Future of the Apple in Minnesota, G. L. Taylor, Howard Lake.
8. Winter-Killing can be Prevented, Andrew Wilford, Cleveland.
9. Apple Experimentation at the Minnesota State Experiment Station, Prof. S. B. Green, St. Anthony Park.
10. Random Thoughts, T. T. Bacheller, Minneapolis.

Appointment of committees on award of premiums, president's address, obituaries and final resolutions.

All annual memberships expire on the first day the annual meeting.

WEDNESDAY MORNING SESSION.

9 o'clock. Be Prompt!

A VERY IMPORTANT SESSION.

General Subject—Annual Reports.

President's annual address, W. W. Pendergast, Hutchinson.
Annual report of the executive board. Wyman Elliot, Chairman, Minpeapolis.
Annual report of secretary, A. W. Latham, Minneapolis.
Annual report of treasurer, A. B. Lyman, Excelsior.
Report of legislative committee, Wyman Elliot, Chairman.
Reports of Vice-Presidents,
Jonathan Freeman, First Cong Dist., Austin.
C. E. Older, Second Cong. Dist., Luverne.
Mrs. A. A. Kennedy, Third Cong. Dist., Hutchinson.
W. J. Tingley, Fourth Cong. Dist., Stillwater.
A. D. Leach, Fifth Cong. Dist., Excelsior.
Frank Mesenburg, Sixth Cong. Dist., St. Cloud.
Reports of Superintendents of Trial Stations.
Prof. S. B. Green [Central Station], St. Anthony Park.
E. H. S. Dartt, Owatonna.
Dewain Cook, Windom.
O. M. Lord [plums and small fruits], Minnesota City.
F. I. Harris, La Crescent.
L. R. Moyer, Montevideo.
Mrs. Jennie Stager, Sauk Rapids.
J. S. Parks, Pleasant Mounds.
F. J. Cowles, West Concord.
10:30 o'clock. Ten minutes intermission.
Report of Committee on Ornamental List.
F. H. Nutter, Minneapolis.
L. R. Moyer, Montevideo.
Fred Nussbaumer, St. Paul.
Reports of Local Societies.
Southern Minnesota Horticultural Society, Albert Lea.
Meadow Vale Horticultural Club, A. W. Keays, Sec., Elk River, and others.
udicial Mindedness in Horticultural Experimentation, L. R. Moyer, Montevideo.
2. The Business Side of Fruit Growing, G. H. Purdy, Mason City, Ia.
3. The Effect of Shelter Belts on Productiveness, Geo. H. Whiting, Yankton, S. D.

Would you like to be one of the 1,500 Members this Society is to have in 1903? Pay $1.00 to the Secretary.

WEDNESDAY FORENOON.

Special Notice to the Ladies.

SOCIAL REUNION

OF THE

Ladies of the Horticultural Society,

INCLUDING THE WIVES OF ALL MEMBERS,

FROM 10 TO 12 A. M., WEDNESDAY,

BY INVITATION OF

MRS. CHAS. M. LORING,

AT HER HOME, NO. 102 CLIFTON AVENUE.

Take the 1st Avenue car to 17th Street, where a gentleman wearing the badge of the Society will be in attendance from 9:45 to 10:30 to direct to the house, two blocks away.

Short talks by Miss Margaret J. Evans and others, music and refreshments, interspersed with ample opportunity for making and renewing acquaintances. A cordial invitation to all, and a very full attendance desired.

WEDNESDAY AFTERNNON SESSION.

1:45 o'clock.

1. Ten Years' Experience in Celery Culture.
   H. J. Baldwin, Northfield.
2. Construction of the Root House,
   F. L. Marsh, Champlin.
3. Observations of a Commercial Traveler.
   C. B. Clark, Minneapolis.
4. Breeding Leguminous Plants,
   Prof. W.M Hays, St. Anthony Park.

2.50 o'clock. Ten minutes intermission.

3:00 o'clock.

Woman's Auxiliary—Joint Session.

1. Secretary's Report,
   Mrs. Anna B. Underwood, Lake City.
2. Influence of the Girls' Department at the Agricultural School. Mrs. Virginia Meredith, Preceptress Minn. College of Agriculture.
3. The Life Worth Living in the Country,
   Miss Margaret J. Evans, Northfield.
4. Home Planting for Ornament,
   F. E. Pease, Des Moines, Ia.
5. The English Sparrow,
   Mrs. G. F. Benson, Lake City.
6. The Country School House Adorned and Beautified,
   F. H. Nutter, City Park Engineer, Minneapolis.

WEDNESDAY EVENING.

8:30 o'clock.

"PICTURESQUE MEXICO."

An illustrated lecture by *P. V. Collins, of "Northwestern Agriculturist."*

One Hundred Fine Colored Stereopticon Views.

A RARE TREAT.

General admission, 50 cts.

Tickets of admission *free to members* of the society for themselves and their friends. Apply to the Secretary.

THURSDAY MORNING SESSION.

9 o'clock. Be prompt.

Announce Annual Meeting Woman's Auxiliary at 10 o'clock.—In adjoining room.

General Subject—Fruit List.

1. Our Duty as Horticulturists,
   Alfred Terry, Slayton.
2. Breakers Ahead! A Warning Cry to Apple Tree Planters, O. M. Lord, Minnesota City.

FRUIT LIST.

A Fruit List for Southern Minnesota,
O. W. Moore, Spring Valley.

A Fruit List for Eastern Central Minnesota,
Wyman Elliot, Minneapolis.

A Fruit List for Western Central Minnesota,
D. T. Wheaton, Morris.

A Fruit List for Northeastern Minnesota,
R. H. Pendergast, Duluth.

Report of Committee on Fruit List.
Clarence Wedge, Albert Lea.
J. P. Andrews, Faribault.
Prof. S. B. Green, St. Anthony Park.

Adoption of Fruit List for 1903.

10:30. TEN MINUTES INTERMISSION.

Report of Committee on Seedling Fruits.
O. M. Lord, Minnesota City.
F. W. Kimball, Austin.
Prof. S. B. Green, St. Anthony Park.

3. A Talk about Seedling Apples on Exhibition,—by Awarding Committee.
4. Chop Talk on Horticulture,
   Wyman Elliot, Minneapolis.
5. Twenty Years with Trees and Fruits in Northwestern Minnesota. F. T. Hazeltine, Crookston.

THURSDAY AFTERNOON SESSION.

1:45 o'clock.

1. Beauty with Utility on the Village Lot,
   David Secor, Winnebago City.
2. Planting and Care of a New Park or Cemetery,
   F. M. Dolan, St. Paul.
3. Evergreens for the Northwest, How to Grow and Transplant, B. E. St. John, Fairmont.
4. My Experience in Planting and Care of Evergreens,
   W. F. Naylor, Wrightstown.

2;45 o'clock. Annual Election of Officers.

3 o'clock.

Minnesota State Forestry Association, Joint Session.

1. Roadside Trees,
   Pres. C. M. Loring, Minneapolis.
2. Our Forest Reserve—The Part which Minnesotans Played in Securing it,
   H. H. Chapman, Grand Rapids.
3. Our Forest Reserve—What it Means to Minnesota and the Country,
   E. S. Bruce, Washington, D. C.
4. The Norway Poplar,
   Emil Sahler, Waseca.

Short Addresses by S. M. Owen, T. L. Duncan and Prof. S. B. Green.

Business Session.

THURSDAY EVENING.

6:30 o'clock.

ANNUAL SOCIETY BANQUET.

(Tendered by "Farm, Stock and Home" for Benefit of John S. Harris' Memorial Tablet Fund.)

At a place to be announced at the meeting. Procure tickets of the Secretary at $1.00.

FRIDAY MORNING SESSION.

9 o'clock. Be prompt.

Report of committees on award of premiums and president's address.

General Subject—Orchard Fruits.

1. Lessons from Pruning, Jonathan Freeman, Austin.
2. Pollination of the Martha Crab—with diagram of orchards, D. C. Hazleton, Nichols.
3. Protecting Apple Blossoms from Frost, N. C. Radabaugh, Minneapolis.
4. Care of the Trunks of Apple Trees, A. D. Leach, Excelsior.
5. Plant Breeding and Hybridization at the International Conference, Prof. N. E. Hansen, Brookings, S. D.

10:30. TEN MINUTES INTERMISSION.

6. Plums, W. W. Pendergast, Hutchinson.
7. Failure of Plum Crop in 1902, A. K. Bush, Dover.
8. The Mankato Plum, Daniel Buck, Mankato.
9. Marketing the Plum, Martin Penning, Sleepy Eye.
10. Growing Cherries in Minnesota, W. S. Widmoyer, Dresbach.

FRIDAY AFTERNOON SESSION.

1:45 o'clock.

General Subject—Orcharding.

1. Planting and Care of the Farmer's Apple Orchard, W. J. Tingley, Withrow.
2. Orcharding on the Farm, Thos. E. Cashman, Owatonna.
3. Orcharding on our Western Prairie, Dewain Cook, Jeffers.
4. Harvesting and Marketing from the Commercial Orchard, W. C. Corbett, 623 E. 15th St., Minneapolis.
5. The Old Story ever New—Girdling Fruit Trees for Productiveness. E. H. S. Dartt, Owatonna.
6. Fifty-Nine Years Experience with Fruits in Minnesota. S. D. Richardson, Winnebago City.
7. The Commercial Orchard in Minnesota, C. L. Blair, St. Charles.

Unfinished Business.

Report of Com. on Obituaries and Final Resolutions.

4:00 P. M.—Two Minute Speeches by Members.

MUSIC.

4:30 P. M.—Closing Remarks by the President.

PROGRAM.

FOURTEENTH ANNUAL MEETING

MINNESOTA BEE-KEEPERS' ASSOCIATION.

To be held in Minneapolis, Minn., Wednesday and Thursday, Dec. 3rd and 4th, 1902. Sessions to be held in Plymouth Church, corner Eighth Street and Nicollet Avenue. Go in on Eighth street side.

OFFICERS.

President, Wm. Russell, Minnehaha Park, Minn.
First Vice-President, Geo. A. Forgerson, Rosemount, Minn.
Second Vice-President, G. H. Pond, Bloomington, Minn.
Third Vice-President, Dr. Mary McCoy, Duluth, Minn.
Secretary, Dr. L. D. Leonard, Minneapolis, Minn.
Treasurer, L. E. Day, Clinton Falls, Minn.

EXECUTIVE COMMITTEE.

H. G. Acklin, St. Paul, Minn., F. A. Gray, Redwood Falls, Minn., Dr. E. K. Jaques, Robbinsdale, Minn.

WEDNESDAY MORNING SESSION.

9:30 o'clock.

Call to order.

Invocation, Victor D. Caneday, Taylors Falls, Minn.

SONG—"The Honeysuckle and the Bee." Miss Edith Dexter, Staples, Minn.

Reading of the minutes.
Report of the executive committee.
Reports of special committees.
Reports of officers.
Receiving communications and bills.

Something of Benefit to Beginners in Bee-Keeping, A. E. Hooker, White Bear Lake, Minn.

Some of My Experience in Keeping Bees in Minnesota, Wm. Cairncross, Plato, Minn.

Question Box.

Bee-Keepers' Program.

WEDNESDAY AFTERNOON SESSION.

1:30 o'clock.

Song — Miss Julia Mondeng, Minneapolis, Minn.

Disposing of Our Crop of Honey to the Best Advantage,
S. Lindersmith, Faribault, Minn

Bees on a Poultry Farm,
Victor D. Caneday, Taylors Falls, Minn.

Question Box.

Would you like to be one of the 1000 Members the National Bee-Keepers Association is to have in 1903? Pay $1.00 to the Secretary.

Bee-Keepers' Program.

THURSDAY MORNING SESSION.

9:30 o'clock.

President's Address.
Wm. Russell, Minnehaha Park, Minn.

Honey Exhibit, — Walter R. Ansell, Milaca, Minn.

Fifteen Minute Talk by the Superintendent of Honey Exhibit at the Minnesota State Fair,
N. S. Gordon, Crookston, Minn.

Bees on the Farm, — Mrs. D. C. Hazelton, Cutler, Minn.

Question Box.

THURSDAY AFTERNOON SESSION.

1:30 o'clock.

Recitation or Reading,
Miss Celia Wood, Minneapolis, Minn.

The Use and Abuse of the Honey Bee,
Frank Yahnke, Winona, Minn.

Election of Officers.

State Dairy and Food Commissioner,
G. L. Dingman, St. Paul, Minn.

Question Box.

Please do not forget to buy your tickets for the Horticultural meeting and take certificates for them to get the reduced railroad rate. See page 3 of this program for particulars.

HORTICULTURAL SOCIETY PREMIUM LIST

All exhibits must be entered with the secretary and in place the first day of the meeting to be entitled to compete for premiums

Exhibitors competing must be members of this society, and the growers of the articles exhibited.

The rules governing the horticultural department of the Minnesota State Fair will be applied except where they conflict with this list.

APPLES.	3d Prem.	1st Prem.	2d Prem.
Collection, not to exceed 10 varieties	$2.00	$6.00	$4.00
Each variety of apples (or crabs) included in the 1902 fruit list of this society, or in the 1902 premium list of the Minnesota State Fair (kept in cold storage)		.50	.25
Each variety of apples (or crabs) included in the 1902 fruit list of this society, or in the 1902 premium list of the Minnesota State Fair (not kept in cold storage)		.50	.25
Peck of Wealthy apples, the fruit exhibited to be at the disposal of the meeting		2.00	1.00

EARLY WINTER SEEDLING.—The fruit shown must have been grown by the owner of the original tree and not kept in cold storage. A specimen of wood three years old (at least six inches long) taken from the tree bearing the apples shown, and a concise history and description of the tree and its fruits must accompany each entry.

Competition is open to all except on such varieties as are being propagated for sale by some person other than the originator. Successful competitors who are not members of the society will be made so for the current year by deducting one dollar, the annual fee, from the amount of the award.

Premium will be divided pro rata among all the entries commended by the judges, according to the comparative merit of each as a commercial fruit. Premium $25.00.

LATE WINTER SEEDLING.—Same conditions as for early winter variety except that if found necessary the fruit shown may be retained and final decision reserved till later in the winter. Premium $50.00.

GRAPES.	1st Prem.	2d Prem.
Each variety included in the fruit list of this society for 1902 or in the 1902 Minnesota State Fair premium list	.75	.50
FLOWERS.		
Collection of ornamental and flowering plants	5.00	3.00
Table bouquet	2.00	1.00

Secretary's Corner.

BRING YOUR FRIEND TO THE ANNUAL MEETING.—This is a practical way of doing service. You enjoy and profit by the meeting; so will he.

THE IOWA STATE HORTICULTURAL SOCIETY.—This association convenes in annual session at Des Moines, Dec. 9, 10, 11. Prof. Samuel B. Green will be there as the delegate of our society.

A PROFITABLE SEEDLING TREE.—The original tree of Lyman's Prolific crab is reported by Mr. Lyman to have borne this year a crop of eight barrels, which brought in the market a little over forty dollars.

BRING YOUR FRUIT TO THE ANNUAL MEETING,—and especially any new seedling fruit of promise. If you know of any such seedlings *anywhere in the state, make it your business* to see that they are shown at this meeting. The hope and promise of the Minnesota orchardist lies in our native seedlings.

PROGRAM OF OUR ANNUAL MEETING.—This program, already mailed to every member, is also printed in this issue for permanent preservation. There must be much of interest in it to every grower of fruit, especially in the Northwest, and so full a consideration of the subject should invite a large attendance. Are you coming?

THE NORTH EASTERN IOWA MEETING.—The North Eastern Iowa Society meets Dec. 16, 17 and 18 at Nora Springs, Ia. Mr. O. W. Moore, of Spring Valley, has consented to represent this society on that occasion. In return, Mr. G. H. Purdy, of Mason City, Ia., will represent that society at our annual gathering.

WHAT IS APPLE BLIGHT?—In an article in the last number of the Wisconsin Horticulturist, Prof. F. Cranefield, of the Wisconsin State Experiment Station, says that blight is a "contagious bacterial disease" and the "only remedy at present known is to remove and destroy by burning the affected twigs." This is the whole theory and practice in a nutshell.

IN MEMORY OF MR. GIDEON.—"Perhaps you remember that I proposed to plant a Eucalyptus tree 'below frost line' in memory of Peter M. Gideon. I *meant* it but thus far have not found such a place. Have arranged to go to Cuba about the last of this month and will try to get a hearing with President Palma and permit to plant my tree on the Capitol Grounds."

Harbor View, Fla., Oct. 8, 1902. A. W. SIAS.

A COLORADO APPLE BOX.—Some apples are coming into the Minnesota market from Colorado, neatly packed in boxes which are said to hold a bushel. As a matter of fact the interior dimensions of the box, 18 in. x 11 ½ in. x 11½ in., figure up to a little over a bushel. It contains 2380 cubic inches, and as a Winchester bushel is only 2150.42 cubic inches, it is over large by 229.58 cubic inches, a very liberal allowance, it would seem. Such a package should hold a full bushel by weight and ought to find favor with both grower and consumer.

A WORD FROM ALASKA —Our long time fellow member, A. H Brackett. writes from Skaguay, Alaska, "How I would like to be at your December meeting", and we can easily believe this, he has always been so zealous for the so-

ciety. An extract from his letter referring to vegetables grown there will interest our reader. "I had a cauliflower weighing 3 lbs. with leaves, root and stock off; a parsnip that weighed 1¼ lbs. and was 13½ in. in circumference and 13½ in. long; a stock of celery resting on its clean roots that measured 3 ft. tall and 10 in. around." He speaks also of a crop of potatoes grown by an acquaintance at Eagle City averaging the grower $1.00 a hill.

COLD STORAGE FOR APPLES.—Minnesota orchardists will be interested equally with those of Iowa in the results of the experiment referred to in the following:

"The Horticultural Department of the Iowa Experiment Station has one hundred barrels of standard varieties of Iowa apples in cold storage to determine the relative keeping qualities of the varieties, the length of time they may be held successfully and the best temperature for storing.

"The Experiment Station at Ames is receiving many inquiries from those who contemplate building storage plants both for private and commercial use. It is a line along which little experimenting has been done, and a subject of special importance to the fruit growers of the Northwest, since we cannot raise successfully the long keeping varieties of the East."

LIST OF THOSE SECURING MEMBERS DURING THE YEAR 1902:

Andrews, J. P., Faribault 6
Anderson, M., Lake Benton 3
Allen, S. R., Brown's Valley 1
Austin, L. E., Glencoe 1
Bachellor, T. T., Minneapolis 1
Bean, D. T., Minneapolis 1
Benjamin, R. G., Hutchinson 1
Benson, J. H., Robbinsdale 1
Blair, C. L., St. Charles 1
Brown, J. A., Windom 1
Bruess, E., Center City 1
Cashman, Thos. E., Owatonna 41
Clark, Wm., Rockford 2
Comee, S. S., Waseca 1
Daniels, R. L., Red Wing 1
Day, Ditus, Farmington 1
Densmore, H., Olivia 1
Elliot, Wyman, Minneapolis 1
Eddy, W. H., Howard Lake 8
Engelrup, Wm., Morgan 2
Eves, Mrs. H. K., Minneapolis 2
Franklin, A. B., Minneapolis 1
Gastfield, A. F., Duluth 1
Gerdsen, Henry, Victoria 1
Gibbs, Oliver, Prescott, Wis 1
Green, Prof. S. B., St. Anthony Park 1
Gregg, O. C., Lynd 1
Haug, G. C., Pennock 1
Higbie, W. S., Washburn 1
Hinds, H. W., Huron, S. D 2
Haff, Guy, Mapleton 1
Hoglund, Olof, Minneapolis 5
Jerabek, J. S., Silver Lake 1
Jewell Nursery Co., Lake City 28
Johannesohn, L., Beltrami 1
Kapphahan, G., Alexandria 1
King, W. V., Jackson 1
Kenney, S. H., Morristown 3
Klovstad, T. A., Milan 1
Le May, J. J., Mendota 1
Loring, C. M., Minneapolis 1
Lyman, A. B., Excelsior 4
Mackintosh, R. S., St. Anthony Park 2
Mighton, S. R., Winnipeg, Man 1
Mitchell, D. M., Owatonna 4
Mills, W. E., Lac-qui-Parle 1
Mohl, F., Adrian 1
Moore, Geo. C., Detroit 1
Moyer, L. R., Montevideo 1
McCulley, P., Maple Plain 2
McKisson, G. D., Charles City, Ia 1
Naylor, W. F., Wrightstown 1
Nelson, Haus, Fergus Falls 1
Olson, M., Montevideo 1
Oslund, N. N., Bethel 1
Parker, W. L., Farmington 1
Pendergast, W. W., Hutchinson 11
Phillips, Walter B., Grand Portage Res 2
Pickle, A. H., Sleepy Eye 1
Rowell, H. H. S., Minneapolis 1
Sandrock, Wm., Rushford 2
Sawyer, O. W., Excelsior 1
Scott, Wm. G., Winnipeg, Man 1
Selvig, C. C., Willmar 1
Shadbolt, Mrs. F., Caledonia 1
Shehan, L. B., West Superior, Wis 1
Smith, Mrs. Geo., Madison 2
Smith, T. T., St. Paul 1
Somerville, Wm., Rochester 2
Stager, Mrs. Jennie, Sauk Rapids 1
Stallkop, O. W., Sherburn 2
Stout, W. H., Champlin 1
St. John, B. E., Fairmont 3
Strand, G. W., Taylors Falls 5
Sundberg, C. A., Worthington 1
Taylor, W. L., Howard Lake 1
Terry, A., Slayton 1
Tingley, W. J., Winthrow 2
Tracy, G. A., Watertown, S. D. 1
Underwood, J. M., Lake City 2
Vilwock, Wm., Owatonna 1
Wagner, D. E., Winthrop 1
Warner, H. C., Forestburg, S. D 1
Witte, H. L. F., Minneapolis 1
Worthley, Chas., Sherburn 2
Yost, F. J. 1
Zellar, John, New Ulm 1

FARMERS' INSTITUTES.

A. K. Bush, Dover 60
L. C. Johonnot, Anoka 158

AUXILIARY SOCIETIES.

So. Dakota Horticultural Society 54
So. Minnesota " " 40
Constance " Club 14
Meadow Vale " Society 12

Annual Meeting.

1901.

JOURNAL OF THE THIRTY-FIFTH ANNUAL MEETING OF THE MINNESOTA STATE HORTICULTURAL SOCIETY, HELD IN MINNEAPOLIS, MINN., DEC. 3-6, 1901.

(For program of this meeting see page 474, Report of 1901.)

TUESDAY MORNING SESSION.

The meeting was called to order by the president, W. W. Pendergast, in Plymouth Church.

The invocation was offered by Rev. C. E. Burton, of the Lyndale Congregational church.

The program was at once proceeded with as follows:

"Greeting." President W. W. Pendergast, Hutchinson. (See index.)

"Planting and Care of a Field of Red Raspberries." F. J. Empenger, Bederwood. (See index.)

"How to Get the Most out of Black Raspberries Commercially." O. M. Lord, Minnesota City. (See index.)

Discussion.

"Strawberries by the Acre." Thos. E. Cashman, Owatonna. (See index.)

Discussion.

"Strawberry Culture on a Large Scale." J. L. Herbst, Sparta, Wis. (See index.)

Discussion.

"Implements for Small Fruit Culture." R. A. Wright, Eureka. (See index.)

Discussion.

"Picking and Packing Small Fruits for Market." C. E. Older, Luverne. (See index.)

Discussion.

Mr. Clarence Wedge: I move that the president appoint a committee of five of our best and most experienced plum growers, to report at the Friday morning session, to devise and recommend the best package for us to adopt in selling plums. The paper Friday morning will be read on that subject, and the report can follow.

The motion was seconded, and being put to vote unanimously prevailed.

"Marketing Fruit by Association." Rolla Stubbs, Bederwood. (See index.)

Discussion.

Prior to the noon adjournment the president appointed the following committees:

Awards of Premiums. Seedling apples, Wyman Elliot, Clarence Wedge and Prof. S. B. Green.

Cold storage apples, C. E. Older.

Apples, not cold storage, O. M. Lord.

Grapes, R. S. Mackintosh.

President's address, Alfred Terry, C. A. Sargent, D. M. Mitchell.

Obituary, L. R. Moyer, W. L. Taylor, J. P. Andrews.

Final Resolutions, T. E. Cashman, A. A. Bost, G. R. Widger.

Credentials, Jno. Freeman, S. D. Richardson, W. P. Rogers.

On motion of Mr. Elliot the meeting adjourned.

TUESDAY AFTERNOON SESSION.

The meeting was called to order at 2:00 o'clock by the president.

The afternoon program consisted of the following:

"Succession of Crops in the Vegetable Garden." W. G. Beardsley, Minneapolis. (See index.)

Discussion.

"The Hotbed and its uses in Vegetable Gardening." Paul Burtzlaff, Stillwater. C. B. Waddell, St. Louis Park. (See index.)

Discussion.

"Melons as a Field Crop." L. P. Lord, Owatonna. (See index.)

Discussion.

"Early Tomatoes in the Open Ground." T. T. Bacheller, Minneapolis. (See index.)

Discussion.

"Ginseng as a Garden Product." Howard Simmons, Howard Lake. (See index.)

Discussion.

"Marketing the Vegetable Products." Frank Code, Minneapolis.

Discussion.

The president appointed the following committee on a standard plum package: Clarence Wedge, A. K. Bush, Dewain Cook, Wyman Elliot, R. A. Wright.

The President: I will introduce to you Dr. F. M. Powell, of the Iowa state society, and I think he will consent to say a few words to us.

Dr. F. M. Powell, (Iowa): Briefly I will say it gives me much pleasure in having the opportunity to attend a meeting of your state horticultural society. I have long known something of it. I have heard something of the members from our state society, and I have had the privilege of reading your reports, which have been of great interest to me. In various ways I have known something of your work, and it has the reputation of being the most progressive horticultural society of which I have any knowledge, and what I have seen today only confirms what I have heard about it. I am certainly

very much pleased and gratified to have this privilege of coming before your society and hope we will have a better acquaintance before leaving. As I am on the program for a paper I will not take any more time this afternoon, but will simply say that I am very glad to meet you and to take a part in the work you are doing.

The President: Dr. Powell, we are pleased to have you with us and pleased with the encouraging words we have heard from you.

Prof. Hansen, of South Dakota, makes it a point to come here every year. We are always glad to see him, and we are always more glad to hear a word from him, and we will be glad to hear a word from him now.

Prof. N. E. Hansen, (S. D.): I sometimes think of it in this way, that the horticultural army is advancing foot by foot from the south and east. I am out on the skirmish line, and it is always good to get back to where horticulture is something of a success from where it is a problem. I like to hear these old men talk, to hear what they have to say to point the way for my future and add to our stock of ammunition on the firing line.

The President: We have already heard from our friend True, but I want to introduce him formally to the society, and we would like to hear a word from him. I want to introduce to you Mr. C. H. True, Secretary of the Northeastern Iowa Horticultural Society.

Mr. C. H. True, (Iowa): Until a few moments ago I supposed I was the only one present from Iowa, but I am happy to know there is another one present. I will simply say that this is an opportunity I have long desired to enjoy. It affords me unusual gratification and pleasure to meet with you. As was stated by Dr. Powell, I have been acquainted for a number of years past with the reputation of your society, and I have been a constant reader of the pages of your annual report, containing the proceedings of your progressive organization, sent me through the kindness of your worthy secretary, Mr. Latham, who has furnished me with several copies of your report. It has also been my privilege to become acquainted with some of your noted horticulturists, among which I might mention the late J. S. Harris, Peter Gideon, O. M. Lord, Mr. Wedge, Mr. Kimball and many others who at different times have been sent as delegates to our society, and who by their experience, by their kind words of encouragement, have exerted a great influence for the good of horticulture in our state. I am here representing the Northeastern Iowa society, and I owe my appointment as delegate to the kindness of your secretary and the president of the Northeastern society, Mr. Reeves. I am not here as an idler, but trust I may carry back to Iowa a large fund of horticultural information, and I want to extend to you an invitation to meet with us next week in northeastern Iowa. I am proud to bring to you the credentials of the Northeastern Iowa society and proud of the sincere and cordial relations that exist between the two societies, which I trust may never grow less, but may ever increase to our mutual enjoyment and benefit.

The President: I may say on behalf of the society that this cordial feeling is fully reciprocated by every member of this society.

Now we have O. W. Moore, of the Southern Minnesota Horticultural Society with us. We are very glad to see his face here, and shall be glad to hear a word from him.

Mr. O. W. Moore: I never had the pleasure of meeting with the state horticultural society before this time. I have been a member of the society for eight or nine years, but I have never met with you before. We organized a local society, called the Southern Minnesota society, some eight years ago, comprising the counties of Fillmore, Mower and Freeborn. We have been struggling along in our weak way. We had at one time some ninety odd members, and then again we had less than that. We are all interested in the work down there. We are also interested in the work that is done up here, and for that matter all over the state of Minnesota and the Northwest. We are proud of our society and proud of the members that belong to it. The old men who took hold of this work in the early days of the state were men of tenacious purpose. They have held on to their purpose. They experimented and failed, they experimented again and failed, and still they had the courage to try again. The success they have attained is evidenced by the exhibition in the other room, and it is a sight that is worthy of their work. The people that emigrated to this state in its early days were made of the right kind of stuff. They were men that were not intimidated by the hardships and privations of a new country, but they have built up a wonderful work, and they built wisely. The evidence is here to that effect. Forty-two years ago this fall I was at Ft. Snelling drilling to go south in the organization of the 1st Regiment to help settle the trouble in the southern states. One Sunday a number of men came up the river as far as Minnehaha Falls. It was then in a wild state. We did not come any further, but I could see up this far where we are at present, and with the exception of a few houses at St. Anthony Falls, a little hotel and a few houses, there was nothing visible to the naked eye, not a single building. I saw this on coming up from Ft. Snelling and passing what was once St. Anthony Falls, and all these things came back to me. With our agriculture and horticulture, with our animal and dairy industries, with our farm school and state university we ought to be a proud people, at least I am proud of the people and proud of the state. (Applause.)

The President: I feel like thanking friend Moore for these reminiscences of the old times, because as he pictures Minnesota as it was then we can fill out the picture and see it as it is today, and see the progress we have made, and this is an encouragement for the future.

Nearly all of us are acquainted with Mr. Philips of Wisconsin. He is one of the old stage horses there. He is known wherever Wisconsin horticulture is known. He has made himself an envious reputation there and in neighboring states. Once in a while he misses a meeting, but he is found with us in most of our meetings. We are always glad to see him and always glad to hear from him. Now I will ask Mr. Philips to say a word.

Mr. A. J. Philips, (Wis.): My wife would be surprised to hear that introduction. I asked her to come here with me, but she said

she would not come until next summer, and then she would go to see Uncle Dartt. Without saying it in so many words, my action for the last thirty years in coming to your meetings ought to convince you people that I like to come. I have always been well used here, and I never come to your meetings without learning something. I am glad to be here. I did not expect to be here. Brother Latham thought I would be needed Thursday night. In the absence of Mr. Herbst I want to say that I am very glad to see so much interest taken on the very first day. I have never heard so many questions asked at the first session, either in this room or in the other room, on apple growing, and by so many young men. I did want to say a few words after my friend True had finished his paper, and that was in regard to the farmers. All the evils coming to the country are largely laid at the door of the farmers. A great deal is laid up against the farmer because he is not interested in horticulture and does not grow apples. It is not because the farmer is a mean man and does not like fruit, but the farm expenses nowadays are very great if a farmer has children. He has to buy horses and buggies, he has got to have a piano for his daughters, and he has got to give his children an education, and the farmer generally has a great deal of expense—and many farmers have interest to pay. They have bought homes, and they are in debt. Whenever you men that are offering five hundred or a thousand dollar premium find an apple that the nurserymen can grow this year and sell to the farmer who can plant it next spring and then take off a crop in the fall and sell it like he does his corn and his wheat to pay his farm expenses, then you can interest the average farmer.

The President: We are after him.

On motion of Mr. Wedge the meeting adjourned.

WEDNESDAY MORNING SESSION.

"The Farmer and Horticulture." C. H. True, Edgewood, Iowa. (See index.)

Discussion.

"Improvement of Plants." W. W. Pendergast, Hutchinson. (See index.)

"Landscape Adornment a Universal Obligation." Jonathan Freeman, Austin. (See index.)

Discussion.

"Beauty and Utility in Ornamentation about the Farm Home." Hon. A. K. Bush, Dover. (See index.)

Discussion.

"Improvement of Private Grounds." C. C. Dike, White Bear. (See index.)

Discussion.

"The Nurseryman's Part in Landscape Adornment." O. F. Brand, Faribault. (See index.)

Discussion.

"An Ideal Public Park." Fred Nussbaumer, Supt. of Parks, St. Paul. (See index.)

"Laying Out and Caring for the Rural Cemetery." A. W. Hobart, Supt of Lakewood Cemetery, Minneapolis. (See index.)

Discussion.

"Parks for the Smaller Towns." F. H. Nutter, Park Engineer, Minneapolis. (See index.)

"Perennial Phlox." W. E. Fryer, Mantorville. (See index.)

Discussion.

"Native Shrubbery in Ornamentation." Lycurgus R. Moyer, Montevideo. (See index.)

Discussion.

"The Ponderosa Pine." A. Norby, Madison, S. D. (See index.)

WEDNESDAY AFTERNOON SESSION.

"My Experience in Horticulture and Tree Growing on Coteau Farm." O. C. Gregg, Lynd. (See index.)

Discussion.

"Heat in the Orchard." Prof. Wm. Robertson, St. Anthony Park. (See index.)

"Legal Protection for the Owner of a Seedling Fruit." J. M. Underwood, Lake City. (See index.)

Discussion.

The President: We do not want to rob the ladies of one single minute of their work. Their session will be a very interesting one, and we would like to have all remain for two reasons, first, for the good they can get themselves out of this session, and, second, out of respect to the women who are doing such a noble work and are doing it purely for the good of the cause. Now we will change from the horticultural society to the Ladies' Auxiliary.

WOMEN'S AUXILIARY.

Miss Emma V. White, president of the Auxiliary, presiding:

Miss White: Last year was the first time we appeared before you in the capacity in which we appear today. The society perhaps was not aware that we were in existence. The fact that we gave you a program last year and have been invited to do so again this year is sufficient cause to feel that we are welcome before this society. Now without further comment we will proceed with our program.

"The Farm Mother and Her Flowers." Mrs. Minnie A. Cummings, Eden Prairie. (See index.)

"The Possibilities of Country Home Grounds." Mrs. O. C. Gregg, Lynd. (See index.)

"An Amateur's Notes on Outdoor Improvement." Mrs. Florence Barton Loring, Minneapolis. (See index.)

Discussion.

"The Possibilities of Club Work in the Rural Districts." Mrs. Anna B. Underwood, Lake City. (See index.)

Discussion.

"School Gardens and Others." F. M. Powell, Glenwood, Ia. (See index.)

Discussion.

"An Undeveloped Field in Flower Culture Among the Children." Mrs. Mildred Meta Barnard, Minneapolis. (See index.)

Discussion.

Mr. Underwood: I wish to congratulate the members of the Ladies' Auxiliary upon the excellence of their program, and more particularly congratulate the society upon having the ladies with us. If we can have such practical papers as have been presented here for us to consider, and have time to consider and digest them, I am certain we could get many excellent ideas and suggestions we have never thought of before. I only wish we had a whole day to consider the papers we have listened to this afternoon.

On motion of Mr. Philips the society adjourned.

THURSDAY FORENOON SESSION.

"President's annual address." W. W. Pendergast, Hutchinson. (See index.)

Discussion.

"Annual report of the executive board." Wyman Elliot, Chairman, Minneapolis. (See index.)

On motion of Mr. Wedge the report of the executive board was adopted.

"Annual report of secretary." A. W. Latham, Minneapolis. (See index.)

On motion of Mr. Seth Kenney the report of the secretary was adopted.

"Annual report of treasurer." A. B. Lyman, Excelsior. (See index.)

On motion of Mr. Alfred Terry the report of the treasurer was adopted.

"Reports of vice-presidents." Jonathan Freeman, First Cong. Dist., Austin. (See index.)

Discussion.

C. E. Older, Second Cong. Dist., Luverne. (See index.)

W. J. Tingley, Fourth Cong. Dist., Stillwater. (See index.)

A. D. Leach, Fifth Cong. Dist., Excelsior. (See index.)

Discussion.

Frank Mesenburg, Sixth Cong. Dist., St. Cloud. (See index.)

J. L. Adams, Seventh Cong. Dist., Glenwood. (See index.)

The President: We have with us Mr. McMullen, the superintendent of the horticultural department of the Pan-American Exposition, and I do not think we can spend a few minutes more profitably than by having him tell us something about that department. (For remarks of Supt. Jas. McMullen, see index.)

The President: We were very glad to hear this excellent report from Mr. McMullen, and I am sure I voice the thought of the society when I thank him for coming here and telling us these things.

"An Orchard Experience of One-third Century." A. Wilfert, Cleveland. (See index.)

Discussion.

"Reports of Superintendents of Trial Stations." Prof. S. B. Green (Central Station), St. Anthony Park. (See index.)

Dewain Cook, Windom.. (See index.)

Chas. W. Sampson (grapes), Eureka. (See index.)

O. M. Lord (plums and small fruits), Minnesota City. (See index.)

Discussion.

F. I. Harris, La Crescent. (See index.)

L. R. Moyer, Montevideo. (See index.)

Mrs. Jennie Stager, Sauk Rapids. (See index.)

Wm. Somerville, Viola. (See index.)

J. S. Parks, Pleasant Mounds. (See index.)

On motion of Mr. Wedge the meeting adjourned.

THURSDAY AFTERNOON SESSION.

"Memorial Hour." (See index.)

ELECTION OF OFFICERS.

The election of officers resulted as follows:

President, W. W. Pendergast, Hutchinson.

Treasurer, A. B. Lyman, Excelsior.

Members Executive Committee for three years, J. P. Andrews, Faribault; L. R. Moyer, Montevideo.

To fill the unexpired term of J. S. Harris, A. K. Bush, Dover.

On motion of Mr. Wedge the secretary was instructed to cast the ballot of the society in favor of the present incumbents for vice-presidents to succeed themselves.

On motion of Prof. Green the selection of vice-presidents from the two new congressional districts was referred to the executive committee, with power to act.

MEETING OF MINNESOTA STATE FORESTRY ASSOCIATION.

(See index.)

FRIDAY MORNING SESSION.

The meeting was called to order by the president at 9 o'clock, and the regular program of the day taken up.

"Varieties for the Commercial Orchard." J. A. Howard, Hammond. (See index.)

"Preparation of Soil for the Commercial Orchard." J. C. Hawkins, Austin. (See index.)

Discussion.

"Laying Out the Commercial Orchard." R. H. L. Jewett, St. Paul. (See index.)

Discussion.

"Cultivation of the Commercial Orchard before and after Bearing." Roy Underwood, Lake City. (See index.)

Discussion.

"Gathering the Increasing Crop from the Commercial Orchard." W. S. Widmoyer, Dresbach. (See index.)

Discussion.

"Varieties and Culture of Cherries in the Orchard." Frank Yahnke, Winona. (See index.)

Discussion.

"How to Sell the Crop from the Commercial Orchard and Get Full Value in Exchange." Carl Vollenweider, La Crescent. (See index.)

Discussion.

The committee on president's address submitted the following report: (See index.)

On motion of Mr. Blair the report of the committee was adopted.

Mr. Wedge: The committee appointed day before yesterday to make a recommendation to the society regarding the best package for marketing plums is ready to report and submits the following: (See index.)

Discussion.

On motion of Mr. O. F. Brand the report was adopted.

On motion of Mr. Elliot the meeting adjourned.

FRIDAY AFTERNOON SESSION.

The meeting was called to order at 1:30 by the president, and the afternoon topic was at once taken up.

"Growing Seedlings to Improve the Apple and Plum." Wyman Elliot, Minneapolis. (See index.)

Discussion.

The committee on Fruit List submitted its report. (See index.)

Discussion.

On motion of Prof. Green the report of the committee was adopted.

"Practice of Budding and Its Relation to the Improvement of Fruits, Illustrated." R. S. Mackintosh, St. Anthony Park. (See index.)

Discussion.

"Selection of Wood for Grafting." Clarence Wedge, Albert Lea. (See index.)

"Science and Practice of Cross-Pollination." Prof. N. E. Hansen, Brookings, S. D.

Discussion.

"Bud Variations and 'Sports' in Improving Fruits." Prof. S. B. Green, St. Anthony Park. (See index.)

Discussion.

"Adaptation of Stock and Grafts in Improving Fruits." A. J. Philips, West Salem, Wis. (See index.)

Discussion.

"Influence of Cultivation on the Permanent Improvement of Fruits." Dewain Cook, Windom. (See index.)

Discussion.

Mr. T. E. Cashman, chairman of the committee on final resolutions then presented a report.

REPORT OF COMMITTEE ON FINAL RESOLUTIONS.

Your committee on final resolutions beg leave to offer the following report:

Resolved, that we extend our heartfelt thanks to our president and secretary, who have given such efficient service in the upbuilding and promoting the best interest of this society—for to them is due the credit of leading the movement in securing the largest membership of any society in the United States, which has passed the "Thousand" mark. Also be it further

Resolved, that a vote of thanks be tendered members who have taken such pains and with great expense selected and preserved the splendid selection of fruits to make an attractive exhibit, as this is one of the most encouraging features of our meetings.

Also to the ushers and others who have contributed to the success of one of the most interesting meetings in the history of this society.

Also the society should be extremely grateful to the members who have prepared so carefully the very interesting papers, which made up the program of this meeting.

Also, that we extend our thanks to the press which has taken such an interest in our deliberations by placing before the public the grand work in which we are engaged—and especially for the many character portraits which have appeared in their columns of some of our prominent members.

THOS. E. CASHMAN,
A. A. BOST,
G. R. WIDGER,
Committee.

On motion of Prof. Green the report of the committee was unanimously adopted.

The President: I do not know whether the officers feel more indebted to the committee for this very fine report or to the artist who got up these fine pictures; I think it is about a stand-off.

On motion of Mr. Wedge the report of the obituary committee was passed and the report ordered printed in the proceedings. (See index.)

"Two Minute Speeches," by H. V. Poore, M. Cutler, Clarence Wedge, O. W. Moore, A. F. Brayton, Wyman Elliot, C. M. Loring, R. H. L. Jewett, Oliver Gibbs, Z. K. Jewett, F. I. Harris, O. F. Brand, C. E. Older, Seth H. Kenney, the President, Frank Yahnke, C. H. True, Jonathan Freeman, Ditus Day, Prof. S. B. Green, Wm. Oxford, L. R. Moyer.

On motion of Mr. Taylor all delegates of neighboring and state societies were made honorary members for one year.

The President: It is now time to close this our annual meeting for another year, and I hope we shall meet again a year from this time with undiminished numbers, just as hopeful and enthusiastic, and with more encouragement if possible than we have felt at this meeting.

As a fitting close the audience rose and joined hands, and led by Miss Beatrice Pickthall, sang "Auld Lang Syne."

Executive Board.

1902.

RECORDS OF THE EXECUTIVE BOARD OF THE MINNESOTA STATE HORTICULTURAL SOCIETY FOR THE YEAR ENDING DEC. 1, 1902.

Meeting held at the secretary's office, at 8 p. m., Dec. 2, 1901. Members all in attendance. The accounts of the treasurer for year 1901 were examined and approved. They show a balance on hand of $959.48. The secretary's accounts from June 19, 1901, to date were examined and approved, and an order drawn on the treasurer for the amount he expended during that period, $326.96. The receipts of his office during that period were $413.03.

The report of the Gideon Memorial Committee was received and approved and the committee continued.

It was decided to discontinue the trial station of C. W. Sampson, at Eureka, and establish one at West Concord, with F. J. Cowles as superintendent.

The secretary was directed to have dies made for a medal to contain the society seal on one side and the words, "In Recognition of Services to Northern Horticulture," with space reserved for an inscription on the other; and to have twelve silver medals struck.

Account for premiums at summer meeting, 1901, allowed....$78.50

Adjourned *sine die*.

WYMAN ELLIOT, Chairman.

A. W. LATHAM, Secretary.

Meeting held in Plymouth Congregational church, Minneapolis, 1 p. m., Dec. 6, 1901.

All present except A. K. Bush.

Wyman Elliot was elected chairman of the board for the ensuing year, and A. W. Latham was elected secretary at a salary of $1,000 per year.

The salary of the president was fixed at $25, and that of the treasurer at the same.

The following delegates were appointed:

J. M. Underwood, Iowa State Horticultural Society.

Jonathan Freeman, N. E. Iowa Horticultural Society.

L. R. Moyer, S. D. State Horticultural Society.

Wyman Elliot, Wisconsin State Horticultural Society.

Messrs. Elliot, Green and Latham were appointed a committee to attend to the rental of a new office when considered advisable; also to appoint the standing committees for the year and vice-presidents for the newly-created districts, the 8th and 9th.

Adjourned *sine die*.

WYMAN ELLIOT, Chairman.

A. W. LATHAM, Secretary.

Meeting held in secretary's office at 8 p. m., June 18, 1902.

Present: Wyman Elliot, J. P. Andrews, Sam'l B. Green, L. R. Moyer, Clarence Wedge and A. W. Latham.

After consideration of the subject of getting a medal for the society it was decided to postpone indefinitely the whole matter.

The Gideon Memorial Committee reported progress, and further action was left to the judgment of the committee.

It was unanimously voted to recommend to the society at its next meeting the following persons to be voted upon as honorary life members of the society, viz.: A. J. Philips, West Salem, Wis.; Wm. Lyons, Minneapolis; W. W. Pendergast, Hutchinson.

The following bills were audited and allowed:

A. W. Latham, Sec., expense secretary's office from Dec. 2, 1901, to June 18, 1902..... $1,433.53

A. B. Lyman, premiums for winter meeting..... 140.91

Adjourned *sine die*.

WYMAN ELLIOT, Chairman.

A. W. LATHAM, Secretary.

LIST OF MEMBERS, 1902.

Annual Members.

Acklin, H. G.....1014 Mississippi st., St. Paul
Allen, Wm.....Le Roy
Allen, S. E.....Browns Valley
Anderson, Nils.....Lake City
Anderson, H. G.....Norsland
Ahlin, August.....Exeter, California
Andree, J. H.....Wheaton
Anderson, P. E.....Kandiyohi
Akin, D. F.....Farmington
Andrews, J. P.....Faribault
Alling, S. A.....Homer
Anderson, Chace.....St. Anthony Park
Ackerson, A. E.....Erdahl
Anderson, Adolph.....Renville
Anderson, Erik.....Lake Park
Aultfather, Chas.....Austin
Aschenbeck, J. H.....731 4th av. N., Mpls.
Anderson, Mathias..... Lake Benton
Abbott, C. A.....St. Charles
Aune, Olaf.....Underwood
Ackerman, A. W.....Young America
Arntzen, C. J.....Wegdahl
Anderson, Nels W.....Wayzata
Alvord, W. E.....Sherburne
Alin, Alex.....Fullerton, S. D.
Avery, H. M.....Sioux Falls, S. D.
Austin, S. A.....Faribault
Andrews, Jas.....Hurley, S. D.
Armstrong, John.....De Smet, S. D.
Anderson, Peter.....Hazel Run
Anderson, Alfred S.....Clarkfield
Aanes, N. J.....Clarkfield
Arnold, James.....Vesta
Amundson, J. C.....Boyd
Aspden, H. H.....Excelsior
Albertson, Henry.....Lamberton
Achatz, Charles.....Harmony
Anthony, Charles D.....Fairmont
Andrews, Gen'l C. C..833 Goodrich av., St. Paul
Albrecht, Gustave.....Essig
Allen, L. W.....Spring Valley
Anderson, J. C.....Ruthton
Archibald, A. H.....Big Lake
Anderson, Olof.....Princeton
Anderson, Louis.....Rochester
Austin, L. E.....Glencoe
Anticknap, H.....Regina, Can.
Burnes, Geo. A.....500 Nicollet, Mpls.
Broberg, Peter.....New London
Barton, Mrs. Isabella.....Excelsior
Bailey, J. Vincent.....Newport
Boyle, M. S.....Adrian
Baird, Rev. Andrew B.....
.....247 Colony st., Winnipeg, Manitoba
Brenk, Oscar.....St. Michael
Beckley, J.....Nerstrand
Buck, Daniel.....Mankato
Barrie, L. M.....Hutchinson
Bacheller, T. T.....400 Boston Blk., Mpls.
Bailiff, R. L.....Bloomington
Benson, J. H.....Robbinsdale
Bibbins, S. E.....Chatfield
Bost, A. A.....Excelsior
Brimhall, Wm. H.....Merriam Park
Benjamin, Frank.....Hutchinson
Bird, C. E.....Champlin
Bussee, H. F.....Station A, Mpls.
Burtzlaff, Paul.....Stillwater
Brown, Magnus.....Farmington
Beardsley, W. G.....4609 Humbolt N., Mpls.
Bruess, Emil J.....Center City
Bratrud, Albert.....Spring Valley
Bunnell, M. C.....Newport
Bennett, A. M.....Box 205, Minneapolis
Burley, D. Q.....Minnesota City
Barnard, Mrs. M. M...805 7th st. S. E., Mpls.
Barud, Hoken.....Moose Lake
Barsness, J. A.....Spring Creek
Bisbee, John.....Madelia
Benjamin, Charles.....Maple Plain
Brevig, A. L.....Starbuck
Blegen, L. E.....Florence
Brown, J. A.....Windom
Boelk, Ferdinand.....Lansing
Bowers, D. M.....Howard Lake
Bean, D. T.....28th and Blaisdell, Mpls.
Bedford, S. A.....Brandon, Man.
Bean, D. T.....28th and Blaisdell, Mpls.
Bennett, Mrs. Edward.....Waseca
Bischoff, John.....Red Lake Falls
Bauer, Frank.....Adrian
Birkeland, C. C.....Willmar
Brickey, R. S.....Britt, Iowa
Bornt, E. L.....Winnebago City
Barnard, G. H.....Good Thunder
Benjamin, R. G.....Hutchinson
Becker, J. C.....Adrian
Becker, George.....Litchfield
Beaubet, Mathias.....Mendota
Burtness, H. E.....Willmington
Belina, John.....Owatonna
Babb, George.....Bradford
Braley, N. J.....Sherburne
Bailey, J. M.....Valley Springs, S. D
Bailey, C. O.....Sioux Falls, S. D
Bresseler, C. N.....Lake Benton
Beckley, L. H.....Worthington
Bohrer, F. W.....St. Paul, Gen'l Del.
Burns, Edward.....Caledonia
Bradley, Wm.....Washington
Bonwell, Arthur.....Blue Earth City
Buss, O. E.....Edgerton
Berg, A. A.....Murdock
Bumford, A. G.....Garvin
Bergland, O. P.....Dawson
Boulden, S. S.....Walnut Grove
Band, John F.....Lamberton
Borchardt, A. F.....Lamberton
Brant, Christ.....Lamberton
Brown, J. M.....La Crescent
Brodt, H. F.....Fairmont
Buendorf, G.....Banks
Brackett, A.....Excelsior
Bray, N. J.....Hovland
Blair, C. L.....St. Charles
Best, E. C.....1134 Lumber Ex., Mpls.
Berthelsen, Christ.....Albert Lea
Broman, August.....Lake Elizabeth
Baker, Geo. A.....Jamesville
Berry, D. E.....Princeton
Bruce, W. J.....Idlewild
Brown, Aug.....Winthrop
Brunes, Ole.....Hovland
Brandon, Mrs. J. R.....Long Prairie

Bernard, E. E.....Hubert
Bly, C. W.....Osakis
Birge, Mrs. J. L.....Oronoco
Boynton, E. W.....Eyota
Bryden, J. H.....Rushmore
Bickerdike, R. N.....Lykens, Wis.
Broedlow, Christ.....Medford
Bigelow, F. M.....Rochester
Brush, C. C.....Pipestone
Brackett, A. H.....Skaguay, Alaska
Buchanan, D. W.....Winnipeg, Man.
Berry, Frank.....Stillwater
Buell, Max W.....St. Anthony Park
Burton, Prof. M. L.....Montevideo
Baker, B. W.....3333 Colfax S., Mpls.
Boe, H. M.....Milan
Baldwin, H. J.....Northfield
Benson, W. C.....Ellendale
Clausen, H. A.....Sleepy Eye
Cassady, Geo.....Valley Springs, S. D.
Courtright, Wm. V.....Farmington
Crockett, E. D.....35 W. 33rd St., Mpls.
Cook, F. L.....Spearfish, S. D.
Cutler, M.....Hillyard, Wash.
Carlson, Ludwig.....Lindstrom
Cooke, Mrs. Louisa.....Hutchinson
Crone, Ferdinand.....New Ulm
Chapman, R. W.....Plainview
Christenson, Peter.....Hutchinson
Christenson, B. P.....Hutchinson
Cady, Le Roy.....Owatonna
Campion, J. A.....Faribault
Cashman, T. E.....Owatonna
Cashman, M. R.....Owatonna
Carpenter, A. C.....Hutchinson
Cleland, C. R.....Northland
Carroll, R. C.....St. Anthony Park
Cook, Dewain.....Jeffers
Cross, Mrs. E.....Sauk Rapids
Crosby, John.....Dawson
Cramer, F. H.....Lennox, S. D.
Clemons, L. A.....Storm Lake, Ia.
Collins, W. S.....Wadena
Cowan, W. G.....Mankato
Crawford, M.....Cuyahoga Falls, O.
Coleman, Wm.....Elbow Lake
Cowles, F. J.....West Concord
Case, E. E.....Staples
Colgan, W. J.....Rosemont
Comee, S. S.....Waseca
Cuzner, E. A.....37 27th av. SE., Mpls.
Cuzner, Mrs. E. A.....37 27th av. SE., Mpls.
Cutting, F. E.....Byron
Clark, Wm.....Rockford
Cieszinski, J. A.....Owatonna
Coleman, W. E.....Atwater
Chinberg, C. A.....Owatonna
Chowen, W. S.....Excelsior
Christ, Andrew.....Constance
Clausen, P.....Albert Lea
Cragun, J. O. Q.....Jordan
Caswell, C. M.....Jordan
Cragun, James.....Jordan
Crandall, Mrs. Mary.....Montevideo
Clark, Dr. E. F.....Syndicate Arcade, Mpls.
Collar, E. L.....Vermillion, S. D.
Chaussee, Charles.....Vermillion, S. D.
Carpenter, G. L.....Vermillion, S. D.
Cowles, E. D.....Vermillion, S. D.
Campbell, A. C.....Dell Rapids, S. D.
Cedarberg, A. G.....Barrett
Cheney, John.....Beaver Falls
Currie, W. H.....Vesta
Cain, John F.....Tracy
Campbell, M. F.....Tracy
Cole, J. H.....Tracy
Chesney, T. E.....40 18th N. E., Mpls.
Crosby, F. M.....Hastings
Clonston, Robert.....Box 1682, Brainerd
Crouch, A. R.....Granada
Crandall, C. I.....Mankato
Cheney, W. H.....Olivia
Chapin, W. V.....Parker, S. D.
Cooley, Eugene.....Morristown
Carlson, A. B.....Elk River
Crozier, Mrs. Jas.....Glenwood
Christgan, John.....Austin
Crocker, L. R.....Mankato
Chapman, H. H.....Grand Rapids
Cox, E. G.....Detroit
Craig, Bert.....Elk River

Clemens, E. J.....Prescott, Wis.
Chamberd, F. G.....Hanska
Christoph, John.....Hudson
Degner, F. E.....Pratt
Dahleimer, F.....Champlin
Dalseng, J. P.....Starbuck
Drake, G. W. M.....Monticello
Davenport, C. E.....Spicer
Dynes, W. S.....Owatonna
Dodds, J. E.....Wheaton
De Witt, Marion.....Rochester
Daniels, R. L.....Red Wing
Dike, C. C.....White Bear Lake
Day, L. E.....Clinton Falls
Dolan, F. M.....693 Carroll St., St. Paul
De Graff, H.....Avoca
Dean, W. H.....Morristown
Day S. H.....Northfield
Dahl, J. H.....Chandler
Dick, W. L.....Worthing, S. D.
Davison, A. H.....Capitol, Des Moines, Ia.
Dove, N. W.....Wadena
Day, A. A.....Farmington
Davis, Francis.....Goodhue
Dunsmore, Henry.....Olivia
Domrese, F. G.....Magnolia
Deidrich, Wm.....Jordan
De Puy, R. E.....Dennison
Dougan, A. D.....Plankington, S. D.
Dibble, G. L.....Parker, S. D.
De Wolf, M. J.....Letcher, S. D.
Dybrig, Niels.....Colton, S. D.
Dehrer, Henry.....Mendota
Dehrer, Edward..W. St. Paul, S. Wabasha st.
Davis, C. E.....1083 27th ave NE., Mpls.
Deline, W. F.....Cannon Falls
Dotseth, A. O.....Clarkfield
Delamater, D. P.....Edina Mills
Dakota Farmer.....Aberdeen, S. D.
Daily, D.....Walnut Grove
Davis, Evan J.....Tracy
Downs, George.....Hoyt
Dompier, Wm.....313 Wabasha St., St. Paul
Denison, Miss Mary L.....Sherburne
Depuydt, D.....Mankato
Dunnell, W. B....616 Bank of Commerce, Mpls.
Day, E. H.....Clark, S. D.
Dea, John.....1410 W. Lake, Mpls.
De Forest, Newton.....St. Louis Park
Dill, J. G.....Wabasha
Day, Burt W.....Hutchinson
Engel, A.....Morgan
Eves, Mrs. Harriet K.....
.....48th st & 46th av S., Mpls.
Engen, C. H.....Norway Lake
Evans, O. J.....1726 Dupont S., Mpls
Erdahl, Absalom.....Blue Earth
Engleson, F. J.....Hagan
Eastman, H. C.....Sleepy Eye
Empenger, F. J.....Maple Plain
Endsley, P. M.....Guaranty Bldg., Mpls.
Erickson, Albert F.....Braham
Eddy, P. E.....Howard Lake
Eddy, W. H.....Howard Lake
Engam, O. O.....Windom
Engelrup, Wm.....Morgan
Ellison, F. H.....1074 13th av. S. E., Mpls.
Enden, J. H.....Godahl
Esser, Barney.....Adrian
Erickson, J. A.....Alexandria
Erickson, E. M.....Constance
Ellickson, Mrs. A. E.....Lac Qui Parle
Erkens, Joe P.....Jordan
Erstad, A. C.....Zumbrota
Erb, David.....Faribault
Erickson, Albert.....Svea City, Ia
Ellefson, John K.....Dawson
Evans, D. H.....Tracy
Ellingson, T.....Lamberton
Erickson, Ole C.....Hoyt
Eberhard, H. P.....Mound Prairie
Essig, John.....Essig
Erstad, John.....Glyndon
Elmer, John.....Wells
Ericson, G. R.....Goodhue
Eddy, P. P.....Willmar
Elmore, P. N.....Tacoma, Wash.
Frederickson, S. C.....Cobden
Franze, P. J.....Battle Lake
Fink, Christian.....Victoria
Frick, A. R.....Wayzata

Ferguson, O. E.....Luverne
Fryer, W. E.....Mantorville
Fitzer, Chas.....1229 Fremont av N., Mpls
Franklin, A. B.....R. R. 1, Mpls.
Farmer, E. A.....Edina Mills
Foss, J. H.....Long Prairie
Felkey, Jr., D.....Armstrong, Ia.
Fagerburg, Lewis.....Elbow Lake
Felland, L. T.....Sioux Falls, S. D.
Frenn, P. J.....Red Wing
Faraghar, J. H.....Adrian
Farrar, George.....Elgin
Ferguson, B. D.....Benson
Frankland, Thos.....Stonewall, Man.
Freeman, Jonathan.....Austin
Fuller, S. J.....Freeborn
Fredrickson, Aug.....Bernadotte
Frye, P. H.....Willmar
Flint, I. H.....Esdon
Foss, S. B.....Clarkfield
Fering, Andrew.....Hoyt
Fredricson, O. C.....Lamberton
Fleming, Albert.....Vernon Center
Fitch, C. E.....Alwilda, S. D.
Farrar, F. F.....White Bear
Fredholm, Martin.....Albert Lea
Facey, M. V.....Preston
Friedricks, A.....1710 E. Main, Mankato
Folts, Mrs. Fannie.....Princeton
Ferodowill, F.....403 Wash. av. S., Mpls.
Flatin, G. F.....Spring Grove
Fairfield, E. J.....400 1st av. N., Mpls.
Gergen, N. B.....Hastings
Gerdsen, Henry.....Victoria
Gibbs, Mrs. F. H.....St. Anthony Park
Gregor, John.....Hutchinson
Gearty, T. G.....Robbinsdale
Grant, John.....Linwood
Green, Prof. Samuel B.....St. Anthony Park
Goodman, D. E.....Faribault
Glaeser, Jacob.....Owatonna
Grover, A. J.....Zumbrota
Glass, Charles.....Red Lake Falls
Grayling, J. N.....Spring Valley
Goar, J. J.....Montevideo
Gunderson, Carl.....Vermillion, S. D.
Gurney, C. W.....Yankton, S. D.
Glessing, Henry.....Howard Lake
Gustafson, C. A.....Dunnell
Gardner, C. W.....2840 Park av., Mpls.
Greeley, Solomon.....Balaton
Griffen, C. E.....Lamberton
Gohde, H. C.....Wells
Grannis, G. F.....Vernon Center
Glidden, S. H.....Elk River
Gregg, O. C.....Lynd
Gill, H. P.....Burnett
Gordon, F. A.....Sauk Rapids
Gill, Edward.....1 Farrington Pl., St. Paul
Gerber, G. W.....Worthing, S. D.
Gunderson, Dan'l.....Meriden
Gastfield, A. F.....2112 W. 2, Duluth
Gregory, Wm. T.....Hewitt
Gray, W. I.....804 Sykes Blk., Mpls.
Gates, E. P.....2628 Portland, Mpls.
Gates, Miss Georgiana P....2628 Portland, Mpls.
Goss, Z. C.....Wabasha
Goodnature, Geo.....Ellendale
Gangelhoff, C. H.....612 1st av. N., Mpls.
Haldorson, Th. L.....Hallson, N. D.
Hulbert, C. S.....City Hall, Mpls.
Haggard, H.....Excelsior
Hoyt, B. T.....Merriam Park
Heins, H. H.....Lydia
Harris, D. S.....Pipestone
Hawkinson, Chas.....2102 Hennepin, Mpls.
Holingren, Alfred.....Kirkhoven
Hammer, M. E.....Heiberg
Hart, E. W.....Madison, S. D.
Hogan, Walter.....Fergus Falls
Hesselgrave, R. V.....Winnebago City
Herrick, A. E.....Little Falls
Helfort, E. A.....Stillwater
Hawkins, John.....Box 495, Mpls.
Hanscom, W. H.....812 41st av. N., Mpls.
Hamustrom, C. J.....Station A, Mpls.
Hawkins, A. O.....Excelsior
Hillmond.....Elbow Lake
Henry, H. W.....La Porte, Ind.
Hibbs, Dr. R. P .....Albert Lea
Harker, John B.....1726 Ninth av. S., Mpls.
Hays, Prof. W. M.....St. Anthony Park
Holbrook, A. P .....Long Lake
Heine, Herman.....Faribault
Hayworth, Emsley.....Welcome
Hofer, F.....Austin
Hammer, J. T.....Madison
Headley, C. W.....Winnebago City
Hart, W. H.....Pratt
Horney, N. R.....Rockford
Haug, G. G.....Pennock
Higbie, W. S.....Washburn
Highby, L. P.....Albert Lea
Hotson, Aitkin.....Austin
Hawkins, J. C.....Austin
Harrison, H. W.....Le Roy
Howard & Howell.....Spring Valley
Hedland, O. P.....Ostrander
Hendrickson, H. C.....Hartland
Hanson, Otto.....Hartland
Holmquist, Albert.....Gibbon
Haloff, Mrs. Ellen.....Cologne
Hinkley, C. N.....Osseo
Hawkinson, Ole.....Maynard
Hanson, C. A.....Hagan
Hamilton, D. M.....26 Hennepin, Mpls.
Hull, C. J.....Fairmont
Hackel, Louis.....Fairmont
Henschell, A. J.....Owatonna
Hatledal, Ole O.....Benson
Heald, W. H.....Letcher, S. D.
Hansen, L. H.....Irene, S. D.
Hough, Jas. M.....Clear Lake, S. D.
Harrington, D. F.....Sioux Falls, S. D.
Hinds, H. W.....Huron, S. D.
Hanse, L. D.....Mendota
Haeg, David.....Sub. Sta. 9, Mpls.
Hedges, N. V.....Faribault
Hoode, C. O.....Hendricks
Haseltine, F. T.....Crookston
Hanson, A. L.....Ada
Hill, D. C.....Red Wing
Holmes, W. H.....Sherburne
Halvorson, C. A.....Clarkfield
Heilzen, C. A.....Clarkfield
Hawkins, E. O.....Dawson
Hedman, D.....Storden
Hamilton, George.....Lamberton
Hanson, A.....Woodville, Wis.
Hanchett, F. B.....West Lebanon, N. H.
Howe, H. C.....Hunters' Park, Duluth
Hedley, Wm.....Dunnell
Harding, W. A.....Winnebago City
Hoglund, Olof.....720 Vineland Pl., Mpls.
Hamlin, Alonzo.....Spring Valley
Hein, Herman.....New Ulm
Hines, Thomas.....Wells
Harper, B.....Wells
Heen, Helen.....Constance
Holt, A.....2809 18th av. S., Mpls.
Hazard, A. E.....Rushford
Hagen, Ole J.....Hendrum
Hoelm, H. L.....Eagle Lake
Haff, Guy.....Mapleton
Hynson, R. E.....Mankato
Hill, C. A.....Elk River
Heath, Albert.....Elk River
Hunt, H. S.....Princeton
Holt, E. A.....Delhi
Hofer, F.....Austin
Hall, R. E.....Wood Lake
Hayes, J. M.....Brainerd
Harlan, C. H.....Plainview
Hartwig, E. J.....Lake Crystal
Hendrickson, M. P.....Montevideo
Hoyt, Mrs. S. P.....Merriam Park
Hitch, H. E.....Milbank, S. D.
Haberman, Wencle.....Ellendale
Hazleton, D. C.....Cutler
Ivorson, Christ.....Hagan
Ilett, John.....Redwood Falls
Imsdahl, J. T.....Big Woods
Imopersteg, G.....Logan
Iverson, Iver O.....Lamberton
Johnson, M. B.....Nicollet
Johnson, P. G.....Lake City
Jewett, Z. K.....Sparta, Wis.
Juergens, F. H.....39 Aldrich av. N., Mpls.
Jarchow, Geo.....Stillwater

Jorgensen, I. B.....Hutchinson
Jenson, Jens.....Rose Creek
Jones, T. C.....Russell
Jacobson, P. G.....Madison
Johnson, Andrew L.....Constance
Johnson, Fred.....Constance
Johnson, L. M.....Constance
Jensen, Oscar.....Brighton
Jenson, C. M.....Albert Lea
Johnson, James.....Sherburne
Jermstad, E. I.....Brookings, S. D.
Johnson, Lynus.....Spofford
Jesness, L. O.....Morris
Jepson, Frank.....Sub. Sta. 9, Mpls.
Jertson, G. C.....Hazel Run
Johnson, B. G.....Granite Falls
Johnson, John.....Clarkfield
Jones, J. C.....Garvin
Juhnke, Carl.....Sanborn
Johnson, C. W.....Judson
Jones, J. M.....Webster City, Ia.
Judkins, Chas.....Princeton
Jenson, J.....3041 Oakland av., Mpls.
Johnson, D. G.....Cedar Mills
Johnson, A. W.....Constance
Johnson, L. W.....Lismore
Johannessohn, L.....Beltrami
Jones, W. S.....Dassel
Johnson, Gust.....Constance
Kovar, W.....Steele Center
Kingsbury, Mrs. Anna B.....
.....1996 Milwaukee av., Merriam Park
Katzner, Rev. John B.....Collegeville
Koch, Louis.....3317 Second av. S., Mpls.
Kinkade, W. S.....Sioux Falls, S. D.
Kennedy, J. W.....Lake City
Kendall, Mrs. Caroline.....St. Peter
Kohler, Mrs. Otto.....Hutchinson
Kinne, P. F.....Storm Lake, Ia.
Keilty, Peter.....Forest City
Kording, John.....Hayfield
Krog, Jens.....Lake Benton
Kaer, N. C.....2211 24th av. S., Mpls.
Kietzan, G.....Vernon Center
Kingsley, Ida M.....Stewart
Kineman, A. N.....Austin
Kimball, F. W.....Austin
Kearns, W. F.....Box G, Austin
Knutson, Kittle.....Hartland
Kapphahm, Gustavus.....Alexandria
Klorstad, T. A.....Milan
Keating, Richard.....Dell Rapids, S. D.
Kingsbury, E. J.....Sioux Falls, S. D.
Kissel, Jacob.....Sioux Falls, S. D.
Klug, N. R.....Caledonia
Keeber, Elmer.....Lake Benton
Klatt, Wm.....Faribault
Krier, D.....Farmer, S. D.
Koren, J. D.....c. o. N. P. R. R., St Paul
Kidder, B A.....Marshall
Knight, Walter B.....Revere
Kringel, Henry.....Lamberton
Kaetner, C.....Lamberton
Kissner, Louis.....Lamberton
Key, C. L.....St. Peter
Kelsey, Mrs. A. K.....Wells
Keivel, John.....Mankato
Kolbert, John.....Mankato
Klevann, P. P.....Starbuck
King, W. V.....Jackson
Keays, A. W.....Elk River
Keasling, F. J.....Elk River
Kroll, John.....Lake Benton
Kroeker, H. M.....Mountain Lake
Kelly, W. A.....Hickory
Kimball, S. A.....Parker, S. D.
Keogh, Thos.....Taopi
Le Mays, Jas. J.....Mendota
Lord, L. P.....Owatonna
Leach, A. D.....Excelsior
Leath, Fred.....Cleveland
Lake, A. H.....Black River Falls, Wis.
Lund, Alfred.....New Richland
Lundblad, Peter.....Markville
Lester, Erwin.....Jackson
Laughlin, J. R.....Owatonna
Laughlin, Geo.....Fertile
Longfellow, Levi.....1806 Vine Place, Mpls.
Lyman, H. M.....Excelsior
Long, F. B.....607 Kasota Blk, Mpls.
Lundquist, Walter.....Winthrop
Laird, J. C.....Winona
Logering, Aug.....Long Prairie
Lynne, Lars.....Morgan
Lindberg, A. R.....Brainerd
Libby, F. M.....Robbinsdale
Lien, T.....Delavan
Lucken, K. J.....Portland, N. D.
Livingstone, R C.....Spring Valley
Leslie, Samuel.....Waseca
Lough, John W.....Jordan
Leitz, G.....Dover
Lawson, Louis.....Luck, Wis.
Larson, John.....Murdock
Lathrop, Henry W..Box 455, Sioux Falls, S. D.
Lyon, W. H.....Sioux Falls, S. D.
La Mont, Scott.....Jarrett
Le May, J. B.....Mendota
Lomen, O. O.....Decorah, Iowa
Lietz, L.....Dover
Lauve, E. G.....Clarkfield
Livingston, William.....Balston
Lund, G. F.....Providence
Lindsey, B. F.....Slayton
Lees, Peter.....629 S. E. 5th, Mpls.
Lewis, K. W.....Minong, Wis.
Lewis, William.....Rockford
Livingston, J. V.....Center Chain
Liebold, Frank.....New Ulm
Lowe, J. W.....Fairmont
Lord, C. R.....Wells
Lewis, B. N.....Excelsior
Lentz, A. H.....Mankato
Liebbrand, Jacob.....Jordan
Liskey, Mrs. W. E.....Wood Lake
Larson, L.....Princeton
Lysne, Ole O.....R. R. 4, Northfield
Long, A. G.....Excelsior
Lufkin, J. W.....Viola
Larson, R.....Lynn, S. D.
Larson, H. R.....Bristol, S. D.
Libby, Jos.....Zumbrota
Lee, Ole A.....Lennox, S. D.
McKenzie, Mrs. Anna.....Hutchinson
McAllister, W. J.....Slayton
McCabe, B. S.....Cleveland
McCulley, P.....Maple Plain
McTaggart, D. L.....Campbell
McCarthy, Dr. W. F.....Jordan
McHugh, W. J.....Owatonna
McNiel, J. W.....Elk Point, S. D.
McLaughlin, A.....Box 437, Sioux Falls, S. D.
McKisson, G. D.....Fairmont
McIntosh, W. T.....Louise Bridge, Man.
McGillenay, G.....Spring Valley
McRostie, Mrs. J. H.....Owatonna
McGuire, A. J....Exp. Sta., St. Anthony Park
Mills, W. E. L.....Lac qui Parle
Marsh, F. L.....Champlin
Mohl, Fred.....Adrian
Magnusson, Sven.....Harris
Mills, L. D.....Lake Crystal
Mack, Wm.....Belview
Mesenburg, Frank.....St. Cloud
Miller, S. O.....Lakeville
Mansel, W. R.....Adrian
Mills, R. W.....Greenleaf
Manderfeld, Henry.....New Ulm
Moore, O. W.....Spring Valley
Murray, Mrs. Emma N.....Excelsior
Mason, W. B.....Excelsior
Mitchell, D. M.....Owatonna
Mattson, C. G.....Lindstrom
Murray, J. W.....Excelsior
Meiser, Frank.....St. Louis Park
Moyer, L. R.....Montevideo
Marzahn, F. F.....Waterville
Medfelt, H.....Cologne
Merrill, H. L.....Hutchinson
Merrill, Mrs. Martha A.....Hutchinson
Mueller, H. C.....New Ulm
Miller, Nat.....Windom
Moss, W. F.....Reading
Major, E. E.....Hudson, Wis.
Meyer, Henry.....Blue Earth
Metcalf, Elliot F..4621 Fremont av. S., Mpls.
Mullin, P. T.....Hutchinson
Modlin, O. H.....Excelsior
Morris, S. W.....Rochester
Merritt, C. W.....Homer
Moran, J. P.....Cashel
Mitchell, J. L.....Austin

Mann, Lelland.....Winona
Morgan, C.....Spring Valley
Morehouse, A. S.....Watertown, S. D.
Merrill, G. L.....Eklund
Miller, C. A.....Redwood Falls
Mighton, S. R.....Box 524, Winnipeg, Man.
Morton, John.....Havana
Miller, J. H.....Huron, S. D.
Mather, J. H.....Faribault
Malloy, A. T.....Faribault
Massee, A. W.....Albert Lea
Moore, Geo. C.....Box 60, Detroit
Molitor, J. S.....Westline
Montgomery, D. C.....Welcome
Melgaard, H. L.....Argyle
Magnuson, J. E.....Lindstrom
Mager, Victor.....Box 502, Winnipeg, Man.
Moyer, Dr. G. D.....Montevideo
Mertins, Mrs. H. H.....Elk River
Morgan, Erastus.....Elk River
Mills, Mrs. J. S.....Elk River
Mackintosh, R. S.....St. Anthony Park
Mayman, E. W.....Sauk Rapids
Mills, Mrs. L. B.....1774 Irving S., Mpls.
Mesenbring, Otto.....Cologne
Malberg, P. B.....Viking
Miner, J. E.....632 Boston Blk., Mpls.
Mikolai, Jos.....Wells
Meredith, Geo.....Morton
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Maday, Geo.....East Chain Lakes
Mareck, Titus.....1215 Marshall N. E., Mpls
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Nutter, F. H.....Sykes Blk., Mpls.
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Nelson, G. H.....Titonka, Ia.
Ness, John P.....Constance
Nelson, Albert.....Constance
Nudd, I. J..308 S. Main av., Sioux Falls, S. D.
Nelson, Hans.....Box 1228, Fergus Falls
Nilssen, Robert.....Evan
Norenberg, Fred.....Cascade Springs, S. D.
Ness, Paul J.....Dawson
Norwood, F. F.....Balaton
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Nelson, Aug.....Howard Lake
Norton, G. E.....Oakland
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Older, C. E.....Luverne
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Orton, C. J.....Marietta
Osborn, John.....Dassel
Oslund, N. N.....Bethel
Ongstad, H. H.....Pelican Rapids
Otterness, E. L.....Cannon Falls
Olsen, J. E.....New Sweden
Olstad, Casper.....Hanska
Olson, E. C.....Coin
Odden, H. G.....Echo
Olson, Gabriel.....Storden
Ogilvie, Sr., James.....Blue Earth
Ohlson, L. O.....Winthrop
Peterson, John C.....Sleepy Eye
Pond, E. R.....Station D, Minneapolis
Pracna, F. J.....117 Main St. SE, Mpls.
Pfaender, Jr., Wm.....New Ulm
Peterson, F. J.....Waconia
Pell, William A.....Currie
Paul, E. B.....Worthington
Powell, Dr. F. M.....Glenwood, Iowa
Pickert, C. J.....St. Charles
Pendergast, Mrs. Abbie L.....Hutchinson
Peterson, Joseph.....Lake Crystal
Parks, J. S.....Pleasant Mounds
Perry, P H.....Excelsior.
Parker, W. L.....Farmington
Perry, G. S.....Farmington
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Prosser, L. W.....LeRoy
Phelps, G. H.....Mapleton
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Patten, J. W.....Long Lake
Pray, J. W.....135 E. Grant St., Mpls.
Priester, J. M.....Marietta
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Pederson, P. A.....Benson
Pengilly, James.....Shakopee
Parkhill, R.....Chatfield
Peck, E. F.....Austin
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Plummer, A. L.....Altoona, Iowa
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Palm, L.....Princeton
Patch, Isaac.....Robbinsdale
Payne, Frank.....Woodlake
Phillips, C. H.....Echo
Palmer, W. H.....Brownsdale
Polkon, Herman.....Springfield
Poulson, Christ.....
Pickle, A. H.....Sleepy Eye
Powers, T. S.....Grand Rapids
Prestage, Thomas.....Rockford
Prosch, William.....Evan
Peew, S. C.....Fairmont
Pankonien, John.....Wells
Pierce, Oliver.....Hutchinson
Poussin, G. W.....White Earth
Powell, A. E.....Mankato
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Paige, Mrs. C. W.....Dawson
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Powers, James.....Bird Island
Peterson, Charles.....Cottage Grove
Perkins, T. E.....Red Wing
Robinson, Marshall.....640 East Tenth, Mpls.
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Raberge, F. A.....Minnehaha Falls, Mpls.
Rogers, W. P.....Excelsior
Redpath, Thos.....Wayzata
Rowe, Chas.....Hewitt
Richardson, M.....Hutchinson
Ryan, Tim.....Robbinsdale
Rowell, H. H. S.....Care Progress, Mpls.
Ramsden, J. W.....Homer
Ray, Mrs. J. W.....2628 Portland, Mpls.
Rohann, Mrs. M. A.....611 1st av. S., Mpls.
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Robertson, Mrs. Wm.....St. Anthony Park
Reed, A. H.....Glencoe
Reel, E. G. E.....Excelsior
Rendler, C. M.....568 Ohio st., St. Paul
Revier, Charles.....St. Peter
Ramer, P. B.....Canton
Rogers, E. S.....3620 Nicollet av., Mpls.
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Rhorer, S. B.....Morristown
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Ryordan, Wm.....Hancock
Rentz, F. J.....Morris
Robie, H. P.....Webster City, Ia.
Ritter, C. H.....Plainview
Richardson, W. H.....Webster City, Ia.
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Rutherford, Wm. H. A.....Loretto
Rankin, A. W.....916 5th st. S. E., Mpls.
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Rollefson, O. K.....Clarkfield
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Rue, H. K.....Jackson
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Street, H. G.....Hebron, Ills.
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Shadbolt, Frank.....Caledonia
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Shepherd, J. A.....Long Lake
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Shier, Thos.....Redwood Falls
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Swenson, Solomon.....Winthrop
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Sear, Eli S.....Dawson
Sear, G. W.....Dawson
Siljan, C. H.....Madison
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Shaw, Prof. Thomas.....St. Anthony Park
Solem, Rev. O. A. Th.....Halstad
Snyder, C. R.....Fertile
Sulerud, C. L..... Halstad
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Schad, Frank.....Ellendale
Smith, Miss Clara W.."Meadows," St. Paul
Sahler, Emil.....Waseca
Schultz, William .....Hutchinson
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Town, Mrs. Frances L.....Newberg, Ore.
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Tanner, U..... Cannon Falls
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Taylor, S. P..... Six Oaks
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Tiegland, J. L.....Minneota
Taylor, W. L.....Howard Lake
Thompson, O. C.....Farmington
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Tomalin, W. H.....Kildonan, Man.
Torson, H.....Elbow Lake
Tye, John.....St. Charles
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Thornby, J. B.....Dawson

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Van Loon, John..R. R. No 1, La Crosse, Wis.
Vollenweider, Carl.....La Crescent
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Van Vleik, C.....Northfield
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Varley, Mrs. Jesse.....Elk River
Valentine, F. M.....Lennox, S. D.
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Vig, A. T.....Greenbush
Victor, J. A.....Little Falls
Wilwerding, Anton.....Freeport
Walker, J. C... ..616 Calistoga av., Napa, Cal.
Wood, I. M.....Excelsior
Walden, J. M.....Northfield
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Wachlin, Wm.....Faribault
West, Miss Martha B.....
.....2239 Gordon av., St. Anthony Park
Wilcox, J. F.....1030 Marshall N. E., Mpls.
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Wright, A. N.....Owatonna
Warner, H. C.....Forestburg, S. D.
Westfall, W. P.....616 Globe Bldg., St. Paul
Wilkinson, C. B.....Owatonna
Wittman, Aug..Otto and Fairview av., St. Paul
Witte, H. L. F.....629 N. Fifth, Mpls.
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Widger, G. R.....Chatfield
Wedge, Clarence.....Albert Lea
Weld, J. O.....Mound
White, Wm.....Long Lake
Waddell, C. B.....St. Louis Park
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Ware, E.....Clinton Falls
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Wilcox, A. N.....3035 15th av. S., Mpls.
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Wolcott, R. F.....Faribault
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Wessinger, W. A.....
.....Fairview and Jefferson av., St. Paul
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Wright, C. J.....Fergus Falls
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Williamson, Mrs. T. C.....Greenwood, S. D
Wilson, Jas. A.....Thief River Falls
Washburn, Prof. F. L.....St. Anthony Park
Walin, J. N.....Nelson
Woodbridge, W. S.....Duluth
Winnegar, S. A.....Henning
Younger, Albert.....Nelson
Young, W. E.....Owatonna
Yahnke, F.....Homer Road, Winona
Yegge, C. M.....Alpena, S. D
Yost, F. J.....2315 Lilian av. N., Mpls.
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Young, A. P.....Marine Mills
Zitzman, Rev. Aug.....Waterville
Zachman, Frank.....St. Michaels
Zarth, Carl.....Jordan
Zeller, John.....New Ulm

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Clark, Chas. B.....1513 Bryant av N, Mpls.
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Dartt, R. M.....Owatonna
Dedon, W. S.....Taylor's Falls
Dickerson, Wm. L.....Richland, S. D.
Doughty, J. Cole.....Lake City
Dunwoody, Wm. H.....52 S. 10th st., Mpls.
Evans, Sheldon J.....LaCrescent
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Gjemse, L. J.....Hader
Hagen, O. W.....Sleepy Eye
Hall, D. S.....Buffalo Lake
Harris, E. E.....Galesville, Wis.
Harris, F. I.....LaCrescent
Hawley, T. C.....Lake Park
Hobart, A. W. .....1412 W. 36th st., Mpls.
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Howard, J. A.....Hammond
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Jerabek, J. S. .....Silver Lake
Jewett, R. H. L.....Capitol, St. Paul
Johnson, Gust.....Excelsior
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Loose, E. C.....Steen
Loring, C. M.....102 Clifton av., Mpls,
Loring, Mrs. C. M.....102 Clifton av., Mpls.
Lyman, A. B.....Excelsior
Manda, W. A.....Short Hills, N. J.
Manning, W. H.....
.....1146 Tremont Bldg., Boston, Mass.
Macaulay, T. B.....Montreal, Can.
Melinat, Rev. M.....Webster
Mo, Hans.....Sleepy Eye
Nagel, Eggert.....1113 W. Lake st., Mpls.
Nelson, A. A., Jr.....Atwater
Nehring, Edw.....Stillwater
Nusebaumer, Fred.....St. Paul
Pond, H. H.....Bloomington
Poore, Hamlin V.....Bird Island
Randall, E. W.....Hamline
Scott, Rev. W. T.....Morristown
Scranton, Ellsworth.....Montrose
Secor, David.....Winnebago City
Sherman, E. M.....Charles City, Iowa
Schaupp, Chas. F.....Hart
Smiley, Daniel.....Mohonk Lake, N. Y.
St. John, B. E.....Fairmount
Stager, Mrs. Jennie.....Sauk Rapids
Strand, G. W.....Taylor's Falls
Swanson, Aug. S.....St. Paul
Terry, Alfred.....Slayton
Thompson, Mrs. Ida.....Glen Avon, Duluth
Trow, A. W.....Glenville
Underwood, Mrs. Anna B.....Lake City
Underwood, Roy.....Lake City
Warren, W. T.....Woodstock
Wheeler, C. F.....602 Oneida Blk., Mpls.
Wheaton, D T.....Morris
Wright, R. A.....Eureka

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Bass, J. G.....Hamline
Bowen, Mrs. Jas.....327 Beacon st., Mpls.
Budd, Prof. J L.....Ames, Iowa
Bush, A K.....Dover
Brand, O. F.....Faribault
Coleman, N. J.....St. Louis, Mo.
Corp, Sidney.....Hammond
Dartt, E. H. S.....Owatonna

Day, Ditus.....Farmington
Elliot, Wyman,.....815 E. 18th st., Mpls.
Ford, L M.....San Diego, Cal
Gaylord, Edson.....Nora Springs, Iowa
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Kenney, S. H.....Morristown
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Kramer, J. C.....LaCrescent
Lacy, Chas Y.....Longbeach, Cal.
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Latham, A. W.....207 Kasota Blk., Mpls.
Lord, O. M.....Minnesota City
Lyons, Wm.....2924 Clinton av., Mpls.
Manning, J. W. .....Reading, Mass.
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Mendenhall, R. J.....Minneapolis
Oxford, Wm.....Freeburg
Patten, C. G.....Charles City, Iowa
Pendergast, W. W.....Hutchinson
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Richardson, S. D.....Winnebago City
Smith, Truman M.....San Diego, Cal.
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Smith, C. L.....Bemidji
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Van Cleve, Mrs. C. O., 603 5th st. S. E., Mpls.

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True, C. H.....Edgewood, Ia.
Powell, Dr. F. M.....Glenwood, Ia.

LIFE MEMBER DECEASED IN 1902.

J. L. Adams.....Glenwood

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